



# WASH CLIMATE RESILIENCE:

## A Compendium of Case Studies



## A. COMMUNITY-LEVEL

### 1. Creating safe underground water stores in Bangladesh

**Goal:** To establish safe, resilient water supply options for communities affected by flooding and sea level rise.

**Summary/Activities:** Bangladesh's low-lying topography and its location on the Bay of Bengal, means that many of the country's coastal communities are exposed to frequent flooding. Climate change is leading to more frequent and intense storms and rising sea levels. In addition to destroying WASH facilities, these climate hazards can also cause the salinization of groundwater sources (aquifers) which many communities rely on for their drinking water.

UNICEF and partners have worked with the University of Bangladesh and the Government of Bangladesh to pilot a Managed Aquifer Recharge (MAR) system. The concept is simple: water is collected from ponds and roofs. It is then passed through a sand filter and is injected into the shallow saline aquifer to create a freshwater "bubble" of drinkable water. Each MAR system can serve several hundred people and can be easily maintained by communities. The MAR system provides safe water when other traditional sources have been damaged by floods and storm surges. The approach has been scaled up and currently more than 100 MAR systems are operational. Their success so far indicates that the MAR system has the potential to be used throughout Bangladesh and other low-lying areas globally.

**More info:**

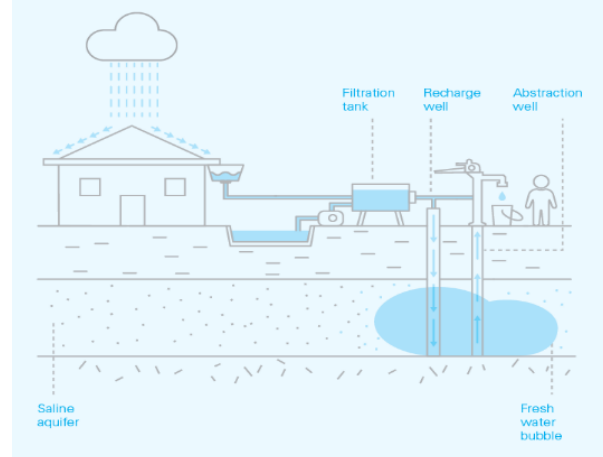
[https://www.unicef.org/bangladesh/MAR\\_WASH.pdf](https://www.unicef.org/bangladesh/MAR_WASH.pdf)

[http://akvopedia.org/wiki/Managed\\_Aquifer\\_Recharge\\_\(MAR\)](http://akvopedia.org/wiki/Managed_Aquifer_Recharge_(MAR))

<https://www.youtube.com/watch?v=ipAd4oyDoL4>



Figure 18. Managed Aquifer Recharge (MAR) System.



## 2. Safeguarding vulnerable island water supplies from the impacts of climate change

**Goal:** To ensure safe and resilient water supply for vulnerable Pacific Island communities

**Summary/Activities:** Given their small size, unique geography and fragile water resources, Pacific Island communities face significant challenges in terms of water and sanitation. Climate change poses further risks by increasing the frequency and severity of natural hazards such as cyclones and raising sea levels.

In Fiji and Vanuatu, UNICEF is working with the Government to roll out the Drinking-Water Safety Planning (DWSP) approach. UNICEF and their NGO partners have trained Village Water Committees to prepare Water Safety Plans, which allows them to identify, prioritize and mitigate existing risks to water supply.

Once the village committees have made improvements and are engaged in management activities agreed on by the community, additional support is provided to develop an investment plan to ensure that enough safe water can be provided for everyone throughout the year. When required, training is also provided to enhance operation and water system maintenance skills.

In Vanuatu, the Department of Water Resources and its NGO partners used the same approach to ‘build back better’ following Cyclone Pam, a Category 5 tropical cyclone that hit in March 2015. The Water Safety Plan process ultimately resulted in rehabilitated or replacement water supply systems that were more resilient than those previously in use, thus ensuring resilience in some of the islands’ most vulnerable communities.

### More info:

<https://rsr.akvo.org/media/db/project/3668/document/WASH%20resilience%20PICs%2029%20Oct%202014.pdf>

[http://www.jstor.org/stable/24686577?seq=1#page\\_scan\\_tab\\_contents](http://www.jstor.org/stable/24686577?seq=1#page_scan_tab_contents)

<http://www.who.int/wspportal/wsp/en/>

[https://www.unicef.org/pacificislands/1852\\_26267.html](https://www.unicef.org/pacificislands/1852_26267.html)



Figure 19. Combined drinking water safety and security planning (DWSSP) approach in Fiji and Vanuatu.



### 3. Building climate-resilient toilets for school children in Mongolia

**Goal:** To ensure access to climate resilient toilets in schools, dormitories and kindergartens.

**Summary/Activities:** According to the *Mongolia Second Assessment Report on Climate Change – 2014*, temperatures in Mongolia have increased by an average of 2° C from 1940 to 2013 as a result of climate change. But these increasing temperatures are not necessarily making the winters warmer. Climate change is increasing the variability of temperatures and the frequency of the uniquely Mongolian weather phenomenon known as the *dzud*, which, every few years, creates an extremely dry summer followed by an extremely cold winter, with heavy snowfall. In the winter, extremely cold temperatures, which can drop to -40° C, prevent children from walking the full distance to use outdoor latrines. This contributes to open defecation in school and dormitory yards, which undermines both children’s health and dignity.

To improve access to WASH in schools, dormitories and kindergartens, UNICEF Mongolia has developed a low-cost and high-quality innovative WASH facility in a container. The containers are equipped with flushing toilets, urinals, wash basins and a shower room and each can serve 30 to 60 students. They can easily be connected to buildings and existing water supply and sewage systems, without the need for major renovation work. The container has an integrated ventilation system, electric connections and insulated walls and ceilings to protect the facilities from freezing temperatures and heat loss.

The containers, introduced in 2014 and installed in the Khuvsgul province and the Nalaikh district, have served around 1,400 children so far, with private sector companies and international already eager to replicate them. In schools, the containers have had a positive effect on children’s hygiene and behavioural outcomes, making it easier for children to use the toilets and wash their hands.

**More info:**

<https://www.unicef.org/wash/waterandclimate/>

[https://www.unicef.org/evaldatabase/index\\_89759.html](https://www.unicef.org/evaldatabase/index_89759.html)

Figure 20. Innovative WASH facility in a container installed at schools in Mongolia



## 4. Constructing flood-resilient toilets and protecting water sources in Peru

**Goal:** To encourage climate resilience through the construction of flood-resilient ECOSAN latrines, collect rainwater and protect freshwater sources in the Peruvian Amazon.

**Summary/Activities:** The regions of the Peruvian Amazon have some of the worst sanitation coverage rates in South America. Almost 100% of families practice open defecation, and the region and the highest prevalence rates of diarrhoea in Peru, reaching almost twice the national average. In addition, communities experience seasonal flooding from December to May each year, which leads to the faecal contamination of soils and water sources. The majority of people living in the region collect water from unprotected sources, such as streams and rivers.

In response to the WASH crisis, UNICEF is rolling out a project which aims to inspire communities to construct, flood resilient latrines. The latrines are raised, above the height of regular floodwaters, with faecal matter being securely contained in a lined and sealed pit. Sawdust or dried leaves are also added to prevent bad odours, encourage composting and discourage insect infestation. The latrines have two chambers, when filling the first it is closed and the other is started. After 8 to 12 months the contents of the cameras can be used as compost. The rooves of the latrines are also used to collect rainwater, which is stored for use during the dryer seasons. Circles of banana trees are also planted around the community, in order to improve drainage and filter dirty water (greywater) from people's homes. The trees also prevent the formation of puddles, which provide breeding sites for mosquitos.

### More info:

[http://www.wsp.org/sites/wsp.org/files/publications/improved\\_latrine\\_options.pdf](http://www.wsp.org/sites/wsp.org/files/publications/improved_latrine_options.pdf)

<https://www.youtube.com/watch?v=9nlvFF2nd3Q>

<http://www.indiawaterportal.org/articles/pricing-options-ecosan-toilet-toolkit-unicef-sei>



## 5. Solar Powered Water Systems in Somaliland

**Goal:** To ensure safe, consistent and resilient water supply in drought-prone regions

**Summary/Activities:** Water has long been a scarce resource in Somaliland, where a two- to five-hour daily walk to fetch household water is not uncommon. Collecting water has traditionally been the task of women and girls, which has a major impact on school and other activities.



In response to increasing water scarcity in the region, UNICEF has teamed up with the Ministry of Water and Mineral Resources (MoWR), the Danish Government and NGO, Red Sea, to install new solar water powered systems in the region. The project also aims to upgrade many of the traditional hand pumps. The new systems break down less frequently than hand pumps, and cost very little to maintain. Such systems are able to support multiple communities and are helping to sustain life, in a region that is highly prone to drought and famine. As such, the solar powered water systems are helping to improve resilience.

Volunteers from the village clean the tank once a week and check the taps for any damage. They also monitor usage, to be sure the precious resource is not wasted.

Due to a general scarcity of water in the region, there is a growing need for finding long-term, low-cost solutions to ensure the safe water supply. This pilot project is an example of how, with a small investment and the strong commitment of community leaders and members, a safe source of water can be made available for multiple communities.

### More info:

[https://www.unicef.org/wash/somalia\\_44827.html](https://www.unicef.org/wash/somalia_44827.html)

[https://www.unicef.org/somalia/wes\\_12327.html](https://www.unicef.org/somalia/wes_12327.html)

## 6. Solar Water Pumping for Schools in the Philippines

**Goal:** To ensure children have better access to safe drinking water, child friendly toilets, and are able to do daily hygiene activities like hand-washing to prevent the spread of diseases.

**Summary/Activities:** One of the most powerful storms in recorded history, “Super Typhoon” Haiyan cut through the Philippines in November 2013. A total of 16 million people were affected, with more than 6,300 people killed and 4.1 million displaced.

Many water, sanitation and hygiene (WASH) facilities at household and school level were damaged or destroyed, and electricity supplies were disrupted, impacting the capacity of many water service providers to operate.

Significant resources were invested in the emergency response and recovery efforts. Under the response plan, the use of solar pump water systems was introduced to schools without water supply and electricity.

The programme aims to build resilient water systems by ensuring that school water supply would not be impacted by electricity cuts during/following storms and floods. Site specific designs were implemented, based on identified risks, such as building stronger foundations for water towers to ensure they could withstand the impact of a typhoon, installing water tower and pump head above the flood line, etc. Additional protective measures have been taken to raise the borehole head and pump above the seasonal flooding level. The pump is driven by solar panels installed on the roof of school building and water is pumped to the water tower, with gravity-fed distribution to classrooms and toilets.

In the case of each school, the Parent Teachers Association (PTA) and community comes together to help install the system, whilst the local Government’s Water Department is assigned to take on any maintenance and repair work. The resilient ‘off-grid’ water system, ensures a safe and sustainable water supply that is safe from the impact of any power outages, particularly during periods of extreme weather.

### More info:

<https://blogs.unicef.org/east-asia-pacific/haiyan-2-years-on-building-back-stronger/>



## 7. Solar powered water supply for drought-prone communities in Uganda

**Goal:** To ensure safe and resilient water supply in rural, drought and flood-prone communities

**Summary/Activities:** Uganda is one of the countries that are greatly vulnerable to climate change impacts, including increasing temperatures, increased frequency and intensity of rainfall, heat waves, droughts, floods and storms. All of these have a direct impact on the reliability and safety of water supply in the country.

In order to address the current and future impacts of climate change, since 2011, UNICEF has been supporting the roll out of solar-powered water systems in rural communities, health centers and schools across the country. The programme focusses primarily on the adaptation of existing water sources (e.g. a borehole with high yielding or surface water such as lake, spring, or river) which is then powered by solar panels, which draw water from deep in the ground. The systems cost very little to maintain and do not rely on expensive fuel supply. They operate automatically (without the need for human intervention) and are also highly durable. As a result, the systems are also being used to power large water supply projects in communities and refugee settlements. One example of this is in Kiriyaandongo refugee settlement, where the solar powered water system is supporting more than 162,000 people.

### More info:

[https://www.unicef.org/environment/files/Uganda\\_solar\\_powered\\_water\\_2014.pdf](https://www.unicef.org/environment/files/Uganda_solar_powered_water_2014.pdf)

[https://www.unicef.org/esaro/5440\\_uga2015\\_no-more-pumping.html](https://www.unicef.org/esaro/5440_uga2015_no-more-pumping.html)

<https://rwsnforum7.files.wordpress.com/2016/11/rwsn-presentation-unicef-solar-system.pdf>





## 8. Planning Safe Water Supply in Kiribati

**Goal:** To end open defecation, promote good hygiene practices and carry out Water and Sanitation Safety Planning (WSP) in communities and schools.

**Summary/Activities:** Kiribati is small island state, located in the Pacific Ocean. The country is extremely vulnerable to climate change due to the small size of its islands and low-lying topography. The impacts of severe weather (such as Typhoons), combined with rising sea levels and flooding, means that water and sanitation facilities are regularly destroyed and contaminated.

The KIRIWATSAN 1 Project aims to end open defecation and provide guidance to island communities on sustainable latrine construction in 70 communities on 16 outlying islands. The project provides guidance on where to build toilets to protect ground water tables, ensure safe distances between latrines and wells and construct resilient toilets.

### More info:

<http://washpacific.weebly.com/kiriwatsan-phase-i.html>

<https://rsr.akvo.org/en/project/3814/>

[http://www.sas.upenn.edu/ppe/Events/uniconf\\_2012/documents/Waradi.vika\\_Final.Paper.pdf](http://www.sas.upenn.edu/ppe/Events/uniconf_2012/documents/Waradi.vika_Final.Paper.pdf)



## 9. Fighting Water Scarcity in the West Bank and Gaza

**Goal:** To improve water security and flood management in West Bank and Gaza

**Summary/Activities:** Both the West Bank and Gaza suffer from severe water scarcity issues, both because of the conflict with Israel (including discriminatory water sharing agreements) and climate change. In response to the crisis, UNICEF has introduced multiple water supply projects in the region including:

- In the West Bank, UNICEF supported the rehabilitation of traditional cisterns contributing to collecting rain water and increasing water availability to households not connected to water networks. This has led to a reduction in water extraction, protecting aquifers and reducing environmental impact.
- In Gaza, UNICEF has supported the rehabilitation of water networks, reducing water leakage and improving the efficiency of Palestine's water supply systems and therefore it's climate resilience. As efficiency increases, emissions have also been reduced, as less energy is needed to pump and distribute the water. This has also helped to reduce Gaza's carbon footprint.
- UNICEF has supported the construction of a Short Term Low Volume (STLV) seawater desalination plant in Gaza, with solar power covering 10% of the plant's energy requirement. UNICEF is also partnering with Massachusetts Institute of Technology (MIT) to install a first-of-its-kind photovoltaic-powered desalination prototype system, which uses only 60% of the energy required for conventional desalination systems.
- In Gaza, a large infiltration pond is currently being constructed to improve flood management. This intervention will also directly contribute to the recharge of the highly depleted costal aquifers and prevent sea water.

### More info:

[https://www.unicef.org/wash/oPt\\_95521.html](https://www.unicef.org/wash/oPt_95521.html)

[https://www.unicef.org/infobycountry/oPt\\_100684.html](https://www.unicef.org/infobycountry/oPt_100684.html)

[https://www.unicef.org/media/media\\_94423.html](https://www.unicef.org/media/media_94423.html)



Rehabilitation of cisterns in the West Bank



Construction of large infiltration pond in Gaza to support flood prevention

## 10. Improving Community WASH and Nutrition Resilience in Rural Bolivia

**Goal:** To protect vulnerable populations from the impacts of climate change through joint WASH and nutrition interventions

**Summary/Activities:** Bolivia is highly vulnerable to the impacts of climate change, particularly in terms of drought, flooding and melting of mountain ice. A recent analysis carried out by Banco de Desarrollo de América Latina (CAF), Bolivia was ranked as having a “very poor adaptive capacity” to climate change, leaving populations even more vulnerable.

Bolivia has already begun to experience the effects of climate change in the form of increased food insecurity; droughts and water scarcity; frequency and severity of natural disasters; number of forest fires and spread in vector borne diseases (MOPSV, 2016). In 2015 it was estimated that 48 out of Bolivia’s 339 municipalities suffered from flooding, while 45 municipalities suffered from drought. Among the worst affected populations are indigenous women and children.

UNICEF is working with the Bolivian Government to strengthen the coordination and operationalization of the national emergency WASH cluster and the development of two National Emergency Plans; one for WASH and one for nutrition. Staff from the Ministry of Health have also been supporting with training on the prevention, response and recovery from disasters.

At the community level, UNICEF is also supporting:

- Participatory risk mapping related to WASH and nutrition
- Strengthen community post-disaster resilience, particularly in terms of re-building WASH systems
- Promoting key hygiene practices (including handwashing) and including more highly nutritious food types within children’s’ diets
- Disaster Risk Reduction (DRR) training (including aspects of climate change) for community health promoters who then pass on this information to the communities in which they work. Training and community sensitisation materials have also been developed.
- Mass communication campaigns including; banners and signboards, radio slots and videos

### More info:

[https://www.unicef.org/about/annualreport/files/Bolivia\\_2016\\_COAR.pdf](https://www.unicef.org/about/annualreport/files/Bolivia_2016_COAR.pdf)

<http://www.unicef.org/bo/wash.html>



Children in Bolivia take part in a community-based handwashing and nutrition sensitisation campaign

## B. SUB-NATIONAL LEVEL

### 1. Hourly drought predictions in India

**Goal:** To improve the monitoring of ground water levels and response to drought, to improve the resilience of communities in Maharashtra, India.

**Summary/Activities:** Maharashtra is a state with a semi-arid climate, located in western India. Around two-thirds of its area is drought-prone, with droughts being declared in 2011–2012, and most recently in 2014–15.

In Maharashtra, groundwater is the main source of drinking water in nearly 85 per cent of rural areas, with populations depending heavily on boreholes or wells to meet their domestic water needs. The state's Groundwater Survey and Development Agency (GSDA) monitors groundwater levels in 1,531 watersheds on a quarterly basis. These evaluations have shown that very few watersheds experience over-exploitation, but drought has caused hundreds of thousands of wells have run dry in the past 10 to 15 years.

UNICEF has worked with the Government of Maharashtra to improve the processes for predicting droughts and water availability, developing a model that can predict the probability of meteorological droughts occurring in a particular year based on the start date of a monsoon. The model can also estimate the amount of groundwater that will be available and predict crop and irrigation demands, based on rainfall data and well fluctuation during monsoon months.

To feed the model, GSDA developed a real-time monitoring network for observation of wells and rain gauges. A water quality monitor appointed by the government collects data from this network in each village using mobile technology. To make the data readily available to decision makers and the public, a web-page dashboard was developed. The tool helps communities better manage their groundwater resources and better allocate water for drinking, irrigation and other purposes. Based on the success of this intervention, the government of Maharashtra is working to scale up the project throughout the state.

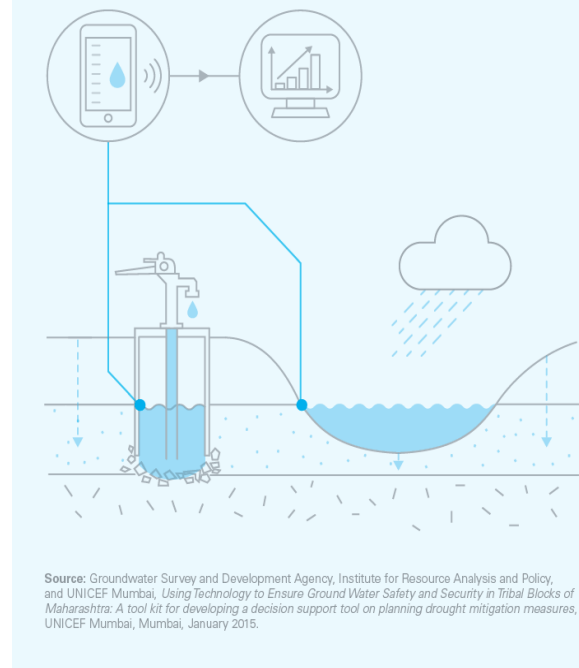
**More info:**

<https://www.unicef.org/wash/waterandclimate/>

[https://www.unicef.org/wash/files/Climate change WASH Brief.pdf](https://www.unicef.org/wash/files/Climate%20change%20WASH%20Brief.pdf)

[https://www.unicef.org/about/annualreport/files/India 2015 COAR.pdf](https://www.unicef.org/about/annualreport/files/India_2015_COAR.pdf)

Figure 22. Real-time monitoring and drought prediction programme in India.



Source: Groundwater Survey and Development Agency, Institute for Resource Analysis and Policy, and UNICEF Mumbai, *Using Technology to Ensure Ground Water Safety and Security in Tribal Blocks of Maharashtra: A tool kit for developing a decision support tool on planning drought mitigation measures*, UNICEF Mumbai, Mumbai, January 2015.

## 2. Using satellites to find groundwater in Ethiopia

**Goal:** To use satellite technology to locate hard-to-find sources of groundwater in drought prone regions in Ethiopia.

**Summary/Activities:** In 2016, Ethiopia experienced one of its worst droughts in decades. The rainy season, which normally falls between June and September, failed in 2015.

In anticipation of the drought in 2015, UNICEF, in collaboration with the European Union and the Government of Ethiopia, piloted the use of remote sensing, which combines scanning of the Earth by satellite with hydrogeological investigation techniques that look for freshwater sources located deep in the ground.

The first test was carried out in northern Ethiopia, in the Elidar district of the Afar region. Average temperatures in Elidar often exceed 40° C; the district receives only about 6 inches of rainfall per year. The majority of the population is highly dependent on pastoralism for its survival and many live in extreme poverty. Because of its arid climate, complex geology and a highly variable topography, it is often extremely difficult to successfully locate groundwater sources in Elidar.

The remote sensing project aims to improve drilling success rates and ensure that more people, particularly children, have access to safe water closer to home. The first phase of the project combined satellite data with additional sources of hydrogeological, meteorological and geophysical data in order to develop maps for nine drought-prone districts that showed the best locations for groundwater drilling. In the project's second phase, 12 boreholes were drilled. The results showed a 92 per cent accuracy rate compared with less than 50 per cent previously. This success has meant that approximately 42,000 people have gained access to safe water. In 2017, UNICEF will be working with partners to scale up the remote sensing project to 39 further lowland districts with the aim of ensuring safe water access for thousands more children living in the most drought-prone areas.

### More info:

<https://blogs.unicef.org/blog/satellites-help-fight-drought-in-ethiopia/>

[http://publications.jrc.ec.europa.eu/repository/bitstream/JRC103616/unicef-jrc\\_hydrogeologicalstudyethiopia\\_part1\\_2016-11-04\\_final.pdf](http://publications.jrc.ec.europa.eu/repository/bitstream/JRC103616/unicef-jrc_hydrogeologicalstudyethiopia_part1_2016-11-04_final.pdf)

<https://www.unicef.org/wash/waterandclimate/>



### 3. Ensuring safe water for communities affected by arsenic contamination in Cambodia

**Goal:** To provide safe, climate resilient water supply in arsenic-prone regions

**Summary/Activities:** In Cambodia, along the Mekong River, climate change and the overexploitation of the aquifers for irrigation has led to water scarcity. This has forced communities to drill deeper wells in order to access water. In Cambodia, a significant percentage of the population also lives in arsenic prone areas which has impacts water safety and poses a direct threat to human health.



In order to counteract this problem, UNICEF in collaboration with the Government of Cambodia, is supporting an innovative partnership between local entrepreneurs, the government and local NGO, GRET. The programme is working to substitute household-owned groundwater wells with commune-wide piped water supply systems which collect and treat surface water from the Mekong River or its tributaries.

The water intakes are usually set up on a floating platform, ensuring that river fluctuations do not affect the systems. Water treatment plants consist of a series of chambers that facilitate the sedimentation of solids in suspension and reduce turbidity. Water is then treated with Aluminium Sulphate and chlorine, for extra safety, before being distributed via pipes to all households. Households pay a small amount for their piped water to local entrepreneurs, who then invest some of the profits in the construction of new infrastructure and maintenance of the systems, which helps ensure their long-term sustainability.

The treatment plants are elevated from the ground and pipes are also buried in order to prevent any potential damage caused by flooding. The systems also provide a vital source of safe water during the dry seasons, thus making them resilient to extreme climatic conditions caused by droughts or flooding.

**More info:**

<http://unicefcambodia.blogspot.com/2016/02/entrepreneurship-supports-clean-water.html>

## C. NATIONAL-LEVEL

### 1. Rwanda's new water supply policy and strategy addresses climate risks

**Goal:** To ensure safe, climate resilient water supply for families across the country

**Summary/Activities:** Rwanda, a tiny landlocked country in the heart of Africa, is already feeling the impacts of climate change. The country regularly experiences flooding, which causes major infrastructure damage, landslides and major loss of life. At the same time, many regions also experience regular water scarcity and drought.



In December 2016, the Government of Rwanda took an important step towards protecting children from climate risks by approving a new National Water Supply Policy and Implementation Strategy. The policy provides clear guidance on improving the country's climate resilience at the national, regional and community levels. It specifically calls for programmes that address the risks posed by climate change and aims to climate-proof new large water supply programmes. UNICEF was instrumental in providing input into the policy, particularly in regards to ensuring the needs of the poorest children were being met.

The Government of Rwanda is also pledging to improve the operation and maintenance of existing water supply infrastructure and provide new resilient water facilities to communities.

The new policy aims to protect existing WASH systems against current climate variability and future change. In addition, the policy also includes provisions for risk-informed planning, prioritizes conservation and protection and mandatory water safety planning.

#### More info:

[http://www.mininfra.gov.rw/fileadmin/user\\_upload/new\\_upload/NATIONAL\\_WATER\\_SUPPLY\\_POLICY\\_IMPLEMENTATION\\_STRATEGY\\_DECEMBER\\_2016.pdf](http://www.mininfra.gov.rw/fileadmin/user_upload/new_upload/NATIONAL_WATER_SUPPLY_POLICY_IMPLEMENTATION_STRATEGY_DECEMBER_2016.pdf)

[https://www.weadapt.org/sites/weadapt.org/files/legacy-new/knowledge-base/files/4e2571828dac3Final\\_Report.pdf](https://www.weadapt.org/sites/weadapt.org/files/legacy-new/knowledge-base/files/4e2571828dac3Final_Report.pdf)

## 2. Financing Climate Resilient Water and Sanitation and using Multiple User Systems in Madagascar

**Goal:** To ensure safe and resilient water and sanitation in the poorest communities, whilst also protecting livelihoods

**Summary/Activities:** Madagascar has one of the worst levels of access to safe water in the world, with just 51 per cent of the population having access to safe water, a figure that has actually declined in the past three years. Malagasy children face multiple climate risks, as the country is prone to cyclones, droughts and floods.

In 2015, UNICEF Madagascar teamed up with the United Nations Development Programme and the Malagasy Climate Change Coordination Office (Ministry of Environment, Ecology and Forests) to apply for US\$5.8 million in climate financing from the Least Developed Countries Fund, managed by the Global Environment Facility. The programme, four years in duration, consists of three main components: strengthening rural institutions; producing agro-meteorological and hydraulic information to help facilitate climate-smart programming decisions (e.g. remote sensing); and support for community-based climate resilience programming.



Specific WASH climate resilience programming approaches being utilized, as part of the programme include:

- Remote sensing techniques to support to develop reliable groundwater suitability maps in drought-prone areas, improving the success rate of borehole siting and increasing programme efficiency.
- The implementation of Multiple Use Water Systems (MUS) approach in drought prone communities. The MUS approach ensures that enough water is made available to support livelihood needs in addition to household needs, whilst at the same time, ensuring the most efficient use of water resources.
- The scale-up of solar powered water systems, particularly in drought-prone regions.

### More info:

<https://www.thegef.org/country/madagascar>

<http://adaptation-undp.org/strengthening-adaptation-and-resilience-rural-communities-facing-climate-change-madagascar>

<https://www.unicef.org/wash/waterandclimate/>



### 3. Prioritising the Most At-Risk Children in Myanmar

**Goal:** To ensure safe and resilient water supply and sanitation for children living in the poorest communities

**Summary/Activities:** Myanmar's climate is changing rapidly. Observable trends over the past 50 years have included an increase in overall rainfall in most areas with a declining trend in others and the late onset and early termination of the south-west monsoon. The country has also observed an increase in extreme weather events and a rise in sea level.

Myanmar is engaged in an active process of reform and change on many fronts, the situation is dynamic and presents great opportunities as well as challenges. The potential impacts of climate change and the relatively low level of preparedness requires an immediate and urgent response.

In 2015, UNICEF began working with the Government of Myanmar to carry out the Child-Centred Risk Assessment. The analysis aimed to provide a visual representation of child-centred risk in different development programmes across the different states. The Assessment provides a child-centred risk index ranking the 14 states and regions of Myanmar, which has allowed UNICEF to prioritise their interventions, particularly in terms of climate resilience, in order to ensure that the poorest children are reached through interventions. For example, in 2016, UNICEF Myanmar supported the installation of 15 new solar powered water systems, providing safe water to 20,000 people.

**More info:**

[https://www.unicef.org/myanmar/Myanmar\\_Child-Centered\\_Risk\\_Assessment\\_\(ENG\).pdf](https://www.unicef.org/myanmar/Myanmar_Child-Centered_Risk_Assessment_(ENG).pdf)

[https://www.unicef.org/wash/myanmar\\_91419.html](https://www.unicef.org/wash/myanmar_91419.html)

