



WORLD  
METEOROLOGICAL  
ORGANIZATION



# The HIGHWAY project

Harnessing scientific research, support for national meteorological services, regional cooperation and community engagement to help vulnerable communities in East Africa



Severe weather on Lake Victoria is estimated to cause some 1 000 deaths by drowning a year, mostly as a result of boat accidents. The High Impact Weather Lake System (HIGHWAY) Project has helped to reduce that figure by 30%, while boosting household incomes in poor fishing communities. The early warning services provided by the HIGHWAY Project are making a real difference for people living in the Lake Victoria Basin. A socio-economic benefits study showed that it also generates around US\$44 million in economic benefits for fishing communities each year.

The International Labour Organization (ILO) estimates that around the world some 24 000 fisherfolk die every year in boat accidents. In addition, thousands more perish when small transport craft are lost in bad weather. Many of these lives could be saved by more initiatives like HIGHWAY.



<https://public.wmo.int/en/disclaimer>

## SAVING LIVES AND RAISING INCOMES THROUGH REGIONAL COOPERATION

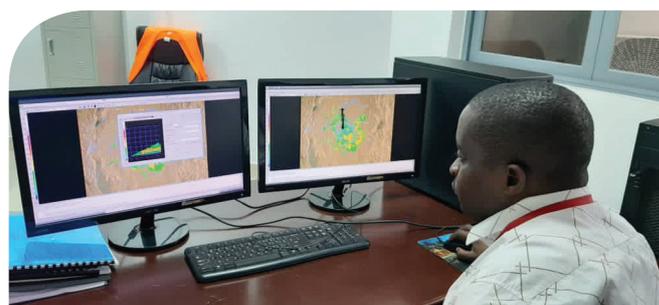
The HIGHWAY Project developed a regional early warning system to alert fisherfolk and others travelling in small boats about high impact weather on Lake Victoria. It laid the foundations for a much broader early warning system that will eventually serve the whole of East Africa.

Between 2017 and 2021, the Weather and Climate Information Services for Africa (WISER) HIGHWAY Project blended several complimentary streams of activity to improve early warning services for the five million plus people living in the Lake Victoria.

**Scientific research** was conducted during the development of severe weather systems on and around Lake Victoria. This informed the design of new forecasting tools.

HIGHWAY helped to **improve surface-based meteorological observations** in the Lake Victoria Basin and optimize their use in forecasting.

The project helped national meteorological services to **design and communicate daily forecasts** for fishermen and other small boat users on Lake Victoria. These forecasts contain severe weather warnings when appropriate. They were co-produced with fishermen and are easy for lakeside and island communities to access on local radio stations.



Analysing images from the Mwanza weather radar in Tanzania  
Photo: Mohamed Salim

HIGHWAY supported the establishment of regional cooperation between national meteorological services within the framework of the East African Community to harmonize marine forecasts and early warning services around Lake Victoria.

The Kenyan, Tanzanian, Ugandan and meteorological services now produce regular forecasts that have a strong track record for accuracy for people who travel on small boats on Lake Victoria. The marine forecast bulletins are similar in format and content in all three countries. In addition to saving some 300 lives a year, such forecasts have enhanced the livelihoods of lake shore and island communities.

Small boat operators reported that they are saving several hundred dollars a year on outboard motor fuel by using the forecasts whenever they can to avoid headwinds and rough water. Likewise, thousands of women who dry freshly caught fish in the sun have cut their losses from rain, which rots fish left out in the open.

## RESEARCH TO DEVELOP NEW FORECASTING TOOLS

Scientists from around the world worked with the national meteorological services of Kenya, Rwanda, Tanzania and Uganda to better understand how severe weather systems form and develop over and around Lake Victoria. In particular, the HIGHWAY Project commissioned research from the Met Office (the UK's national meteorological service) and the Universities Corporation for Atmospheric Research (UCAR) into the formation and evolution of thunderstorms on the Lake.

This research contributed to the design of new forecasting tools for East Africa, some of which are still under development. These tools will help meteorologists to forecast high impact weather conditions on and around Lake Victoria with greater accuracy.



A woman brushes silver fish (*Rastrineobola argentea*) spread out on a mat to dry in the sun. She turns them over so that they dry faster. Photo: Robert Powell

## ENHANCING THE OBSERVATIONS NETWORK

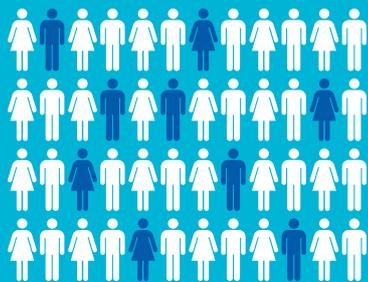
A short campaign of intensified meteorological observations supported the research.

The HIGHWAY Project funded permanent improvements to the meteorological observations network around the lake. It financed the rehabilitation of weather stations and the resumption of balloon launches to undertake soundings of meteorological conditions in the upper atmosphere. HIGHWAY also helped to mainstream the use of weather radar in marine forecasting for Lake Victoria.

## CO-PRODUCING FORECASTS WITH END USERS

The HIGHWAY Project helped Kenya, Tanzania and Uganda to design and communicate special weather forecasts for artisanal fishermen operating from small open canoes. In each country, these forecasts were co-produced with help from working fishermen, radio journalists and local government representatives. This ensured that the weather information was relevant to user needs and easy to understand. The radio stations were keen to broadcast the information in local languages.

### HIGHWAY in numbers



**5.4 million** people live along the shores and islands of Lake Victoria

**30%**

fall in **weather-related deaths** between 2019 and 2020



**20** radio stations broadcast the marine forecasts

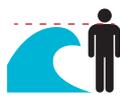
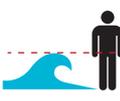
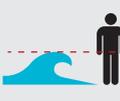
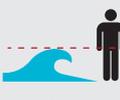


**70%** forecast accuracy

**US\$44 million**

per year is generated in economic benefits to fishing communities



Sunday 29 November	Wind strength	Wind detection	Wave height	Weather	Rainfall distribution	Visibility	Hazards
Sunday Morning	 Moderate	 Variable	 Moderate waves	 Wide spread thunder rain	 Many places	 Moderate	Wide spread thunder rain
Sunday Afternoon	 Moderate	 West	 Small waves	 Sunny intervals		 Good	
Night before midnight	 Light	 West	 Small waves	 Partly cloudy			
Night after midnight	 Light	 South	 Small waves	 Thunder rain	 Many places		

24-hour forecast for the Migingo and southeast marine zone in Uganda with an orange "be prepared" warning. The weather icons and colour shading help users to better understand the information.

The forecasts are published every 12 hours and include severe weather warnings. They go out on local radio stations in the early morning, shortly before most boats leave their landing site for daytime voyages, and again in the afternoon before boats depart on night-time fishing expeditions. The forecasts are also sent to individuals with smartphones at landing sites via a popular messaging app.

## VISION FOR THE FUTURE

Building on the achievements so far, the HIGHWAY Project assisted the East African Community (EAC) to formulate a Vision 2025 Early Warning Strategy to establish a framework for coordinating severe weather warnings throughout its six member states – Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda – over the next five years.

The strategy, which has been approved by EAC ministers, is backed up by plans to establish a network of automatic weather stations on islands and floating buoys in Lake Victoria and other large lakes in the region.

The HIGHWAY Project was funded by the UK Government's Foreign, Commonwealth and Development Office through its Weather and Climate Information Services for Africa (WISER) programme.

For more information, please contact:

**World Meteorological Organization**

7 bis, avenue de la Paix – P.O. Box 2300 – CH 1211 Geneva 2 – Switzerland

**Member Services and Development Department**

Email: [wmoprojects@wmo.int](mailto:wmoprojects@wmo.int)

[public.wmo.int](http://public.wmo.int)