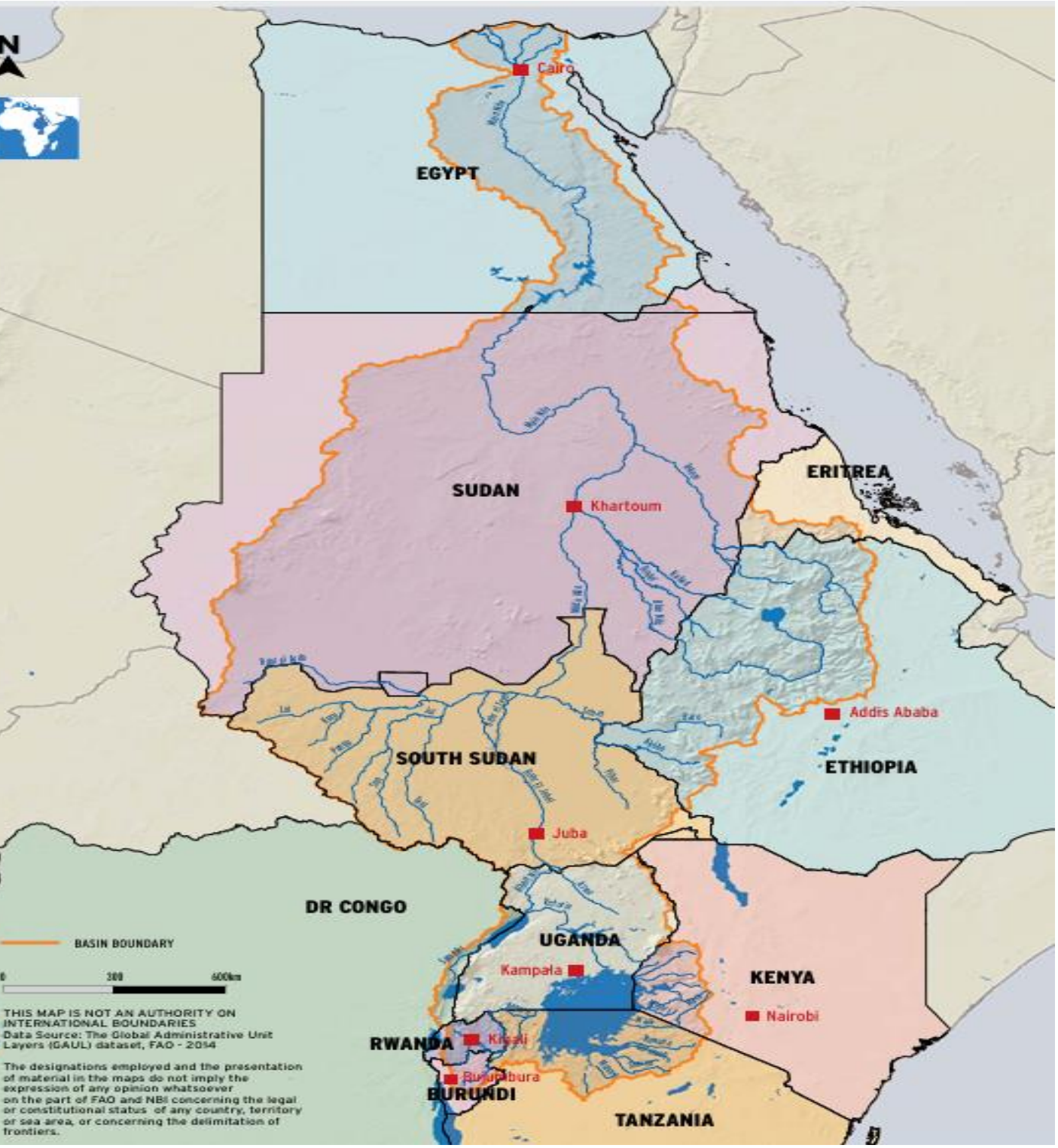


NILE BASIN DAM SAFETY RISK MANAGEMENT FRAMEWORK (NB-DSRMF)

Enhancing Dam Safety in Nile Basin Countries

NELSAP-CU
NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

Nile Equatorial Lakes Subsidiary Action Program Coordination Unit (NELSAP-CU)

March 2025

WHAT IS DSRMF?

A dam safety risk management framework (DSRMF) is a structured approach to identify, assess, and mitigate risks associated with dams. Its primary goal is to ensure the safety and reliability of dams, protecting lives, property, and the environment.

WHY NB-DSRMF?

The Nile Basin, a transboundary river system shared by ten countries, is home to over 800 dams, with additional projects planned. These dams play a crucial role in ensuring water, food, and energy security for the region. However, dam safety has become a significant concern, especially given that the majority of these structures are embankment dams that are vulnerable to failures, particularly due to overtopping.

The risks associated with dam failures in the Basin are evolving due to

- the aging of existing dams,
- changing settlement patterns,
- ongoing construction of new dams, and
- impacts of climate change.

Furthermore, the management of dam safety is severely hampered by limited technical capacity and financial resources, presenting challenges for both regulatory bodies and dam owners/operators.

Risk management offers an effective approach to addressing these challenges by proactively and systematically evaluating and prioritizing the risks associated with the dams in the Nile Basin.

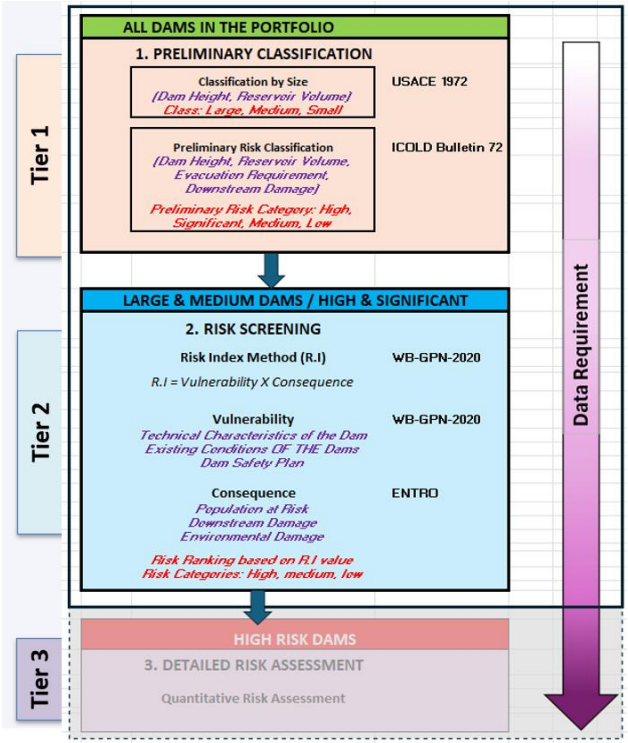
APPROACHES AND METHODES

A tiered portfolio risk management framework has been implemented using a two-tier approach designed to systematically assess and prioritize the risks associated with dams in the Basin. This framework begins with a preliminary risk classification of all dams, categorizing them into four risk categories: high, significant, medium, and low. This classification is based on four parameters outlined in the ICOLD Bulletin 72: dam height, reservoir volume, evacuation requirement, and potential downstream damage.

Once the preliminary risk classification is complete, the second tier involves risk screening of high and significant risk dams using the risk index method, as detailed in the World Bank's Good Practice Note 2000.

The risk index is calculated by taking the product of the dam vulnerability and consequence.

R.I = Dam Vulnerability x Consequence



Dam Vulnerability: *This is assessed by summing various factors, including the* ***technical characteristics of the dam, the existing conditions****, and the* ***safety plan*** *currently in place for that dam.*

Consequence: *This component encompasses the potential impacts of a dam failure, which are estimated as the sum of the* ***population at risk,*** *the* ***downstream damage****, and the* ***environmental damage****.*

RESULTS

Basin-wide Size Classification

Size Class	No of dams (%)
Large	60 (7.4%)
Medium	234 (28.8%)
Small	426 (52.4)

Basin-wide Preliminary Risk Classification

Risk Category	No of dams (%)
IV (high)	28 (3.4%)
III (Significant)	209 (25.7%)
II (moderate)	352 (43.3)
I (low)	55 (6.8%)

Basin-wide Risk Screening

The Risk Index method has been applied to the large and medium dams/high and significant risk dams in the Basin. However, data for risk screening using the risk index method are currently available for only 8 dams, and these dams have been prioritized based on their risk index values.

ACKNOWLEDGMENTS

This study has been financed by the World Bank through the Cooperation in International Waters in Africa Trust Fund (CIWA).