



International Centre  
for Hydropower



# RESERVOIR SEDIMENT MANAGEMENT FOR SUSTAINABLE HYDROPOWER IN AFRICA

21–25 July 2025 Malawi

Application deadline – 26. May 2025

Course fee – €UROS 1000

ICH Members' Course Fee – €UROS 900

Fee includes course materials, meals\*, and accommodation.

Women are  
encouraged  
to apply.



GAINING THROUGH TRAINING



# RESERVOIR SEDIMENT MANAGEMENT FOR SUSTAINABLE HYDROPOWER IN AFRICA

Reservoir sedimentation threatens the operational efficiency and lifespan of hydropower facilities across Africa. Field data from the region shows reservoirs are losing 0.5-1% of their storage capacity annually due to sediment accumulation, with some facilities experiencing losses as high as 3% annually.

Climate change and poor land management practices significantly exacerbate this problem, increasing erosion and sediment transport through more intense rainfall events and altered hydrological patterns. This combination creates a growing challenge for infrastructure sustainability across the continent.

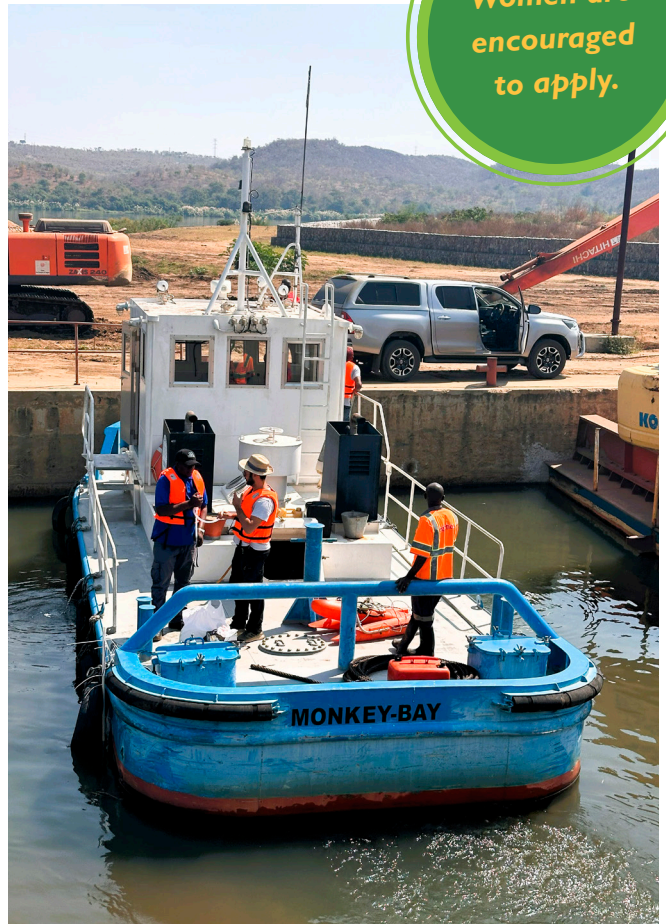
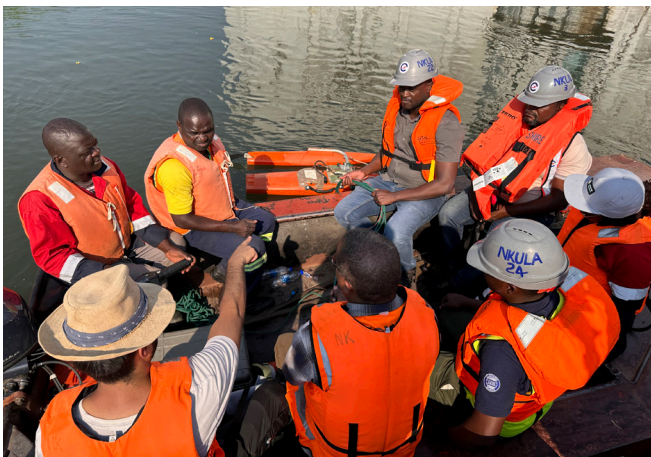
The consequences are immeasurable and significant:

- Reduced power generation capacity (15-30% in severely affected facilities)
- Increased maintenance costs from turbine and equipment wear
- Decreased water quality affecting downstream ecosystems
- Shortened reservoir lifespan compromising long-term energy security
- Diminished reservoir capacity especially for multipurpose uses including irrigation and water supply
- Economic and social repercussions for communities dependent on these resources

Addressing sedimentation requires a multifaceted approach, involving technical, environmental, and policy measures. By integrating sediment management into broader water resource planning and development, African countries can enhance the resilience and efficiency of their reservoirs, ensuring water and energy security for future generations.

This course provides the knowledge and practical skills needed to implement effective strategies that are economically, technically, and environmentally feasible for African contexts. Participants from the 2024 course reported that the knowledge gained was immediately applicable, with potential for significant operational improvements including reduced downtime and lower maintenance costs when techniques are properly implemented.

Women are encouraged to apply.



# RESERVOIR SEDIMENT MANAGEMENT FOR SUSTAINABLE HYDROPOWER IN AFRICA

## COURSE STRUCTURE

Maintaining a careful balance of theory and practice, this course offers:

- Hands-on field experience with direct application of measurement techniques
- Interactive sessions for applying concepts to your specific facilities
- Guided practice with data analysis and sediment modeling
- Real-world case studies from hydropower facilities demonstrating successful implementation

Participants will learn practical sediment management approaches that can be applied within African hydropower contexts. Drawing from established methodologies and regional case studies, the course covers:

- Measurement and monitoring techniques that provide reliable sediment data using equipment available in the region
- Cost-effective management strategies tailored to different reservoir types and sediment loads
- Implementation planning that addresses budgetary, environmental, and operational constraints

## COURSE OBJECTIVES

By the end of this program, participants will develop practical skills to:

- Apply fundamental techniques for measuring and monitoring sediment in reservoir environments
- Interpret sediment transport data and use basic modeling approaches suitable for limited data contexts
- Identify cost-effective sediment management strategies appropriate for African facilities
- Recognize climate change impacts on reservoir sedimentation patterns
- Incorporate sediment management considerations into operational planning
- Perform basic field sampling and understand analytical methods for sediment assessment
- Consider environmental and socio-economic factors in sediment management decisions
- Recognize sediment-related risks and appropriate mitigation approaches
- Engage effectively with stakeholders about watershed management challenges
- Select appropriate sediment management techniques for their specific facility situations

This course provides essential tools and understanding that equips participants with practical knowledge they can immediately apply while continuing to develop their capabilities through ongoing practice at their facilities.



...Practical solutions to real problems

Participants will be able to make an appropriate selection of the technique that may be applicable to their situation.

## MAIN TOPICS

- Sediment yield assessment and monitoring techniques
- Sediment transport mechanisms and practical modeling
- Climate change impacts on sediment patterns in African watersheds
- Innovative sediment control technologies and approaches
- Cost-effective management strategies and optimization techniques
- Field sampling methods and data analysis
- Environmental and socio-economic impact assessment
- Risk assessment and safety measures for sediment management
- Integration of sediment management into operational planning
- Stakeholder engagement strategies for watershed management
- The course includes hands-on exercises, field visits, and interactive sessions designed to enhance understanding and practical application.

*'The field trip was very useful with regards to measuring both suspended and bed loads. It was highly rewarding, providing participants with a valuable hands-on opportunity to apply the concepts learned during the training.'*  
2024 participant



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## REAL WORLD IMPACT & TESTIMONIALS

Participants from our most recent course report tangible benefits:

*'I have initiated changes in the way we report sediment-related issues and handle sediment. I have discovered that we lose significant operational capacity due to sedimentation.'*

**M&E Engineer**, 2024 participant

*'The knowledge gained about the status of the dam helped a lot in the decisions our company made about sediment management afterward.'*

**Power utility manager**, 2024 participant

*'This was a hands-on exposure where participants appreciated the effects of sedimentation in dams ... the accumulation of sediments as time passes makes it difficult for us as power generating entities to realize the required output.'*

**Environmental Officer**, 2024 participant

## TARGET GROUP

This course is designed for professionals actively working with hydropower operations and water resources management:

- Hydropower engineers and technicians
- Dam and reservoir operators
- Water resource managers
- Watershed management specialists
- Environmental officers
- Utility management personnel
- Government officials responsible for water and energy resources
- Practitioners from irrigation and water supply organizations working with multipurpose reservoirs

## ADMISSION REQUIREMENTS

Minimum of 5 years of relevant work experience

An applicable degree or equivalent practical experience  
Proficiency in English.

Diligently complete application form submission by the deadline **26. May 2024**.

## SPECIFICS FOR THE COURSE

Detailed information on travel, the course program, and other relevant details will be sent to participants. Arrival is expected the day before the course starts, and departure no earlier than the day after the course ends.

## WOMEN ARE ENCOURAGED TO APPLY

## COURSE FEE

The fee covers lectures, materials, accommodation, meals\*, and, if applicable, a social program. International travel expenses are not included. Reduced fees are available for ICH members, and limited sponsored seats are provided for participants from countries prioritized by NORAD.



## CONTACT;

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