CENTRAL WATER AND POWER RESEARCH STATION

SEDIMENTATION STUDIES FOR RIVER UMIEW, MEGHALAYA

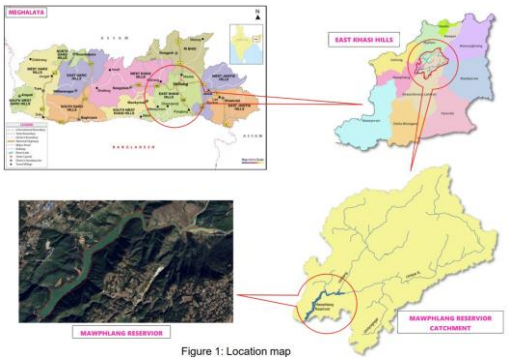

Figure 1: Location map

STUDY OVERVIEW

Sedimentation studies were conducted for the Umiew River, a major tributary in East Khasi Hills, Meghalaya, to assess the impact of quarrying on reservoir siltation. Using bathymetric surveys and HEC-RAS modelling, a significant reduction in the Mawphlang reservoir's storage capacity was observed. The study identified quarrying as a major cause and recommended regulatory interventions to protect Shillong's primary water source.

APPROACH

The study began with joint field visits to identify sediment sources. Key steps included:

1. Model River Umiew to study sedimentation from stone quarrying.
2. Identify erosion/deposition zones and their extent.
3. Recommend measures to prevent sediment entry.
4. Pinpoint vulnerable stretches and suggest bank protection if needed.
5. Survey Mawphlang reservoir to determine current capacity and storage loss.

KEY FINDINGS

- Mawphlang reservoir lost 2.54 MCM storage in 20 years; more loss expected if trends continue.
- The main cause is unregulated quarrying and poor waste management.
- Sediment traps are full and not working; rules are not strictly followed.
- Steep river slopes carry all sediment directly into the reservoir.
- Reservoir's shrinking capacity threatens Shillong's water supply.

SIGNIFICANCE/OUTCOME

The study,

- Highlights a critical threat to Shillong's main drinking water source due to rapid sedimentation.
- Identifies quarrying and human activities as major causes, providing scientific evidence for policy action.
- Provides a reliable model (HEC-RAS) to predict future sedimentation and guide decision-making.
- Recommends urgent management actions, such as reservoir flushing, stricter regulation, and better monitoring.
- Supports long-term planning for sustainable water resource management in the Mawphlang reservoir catchment.

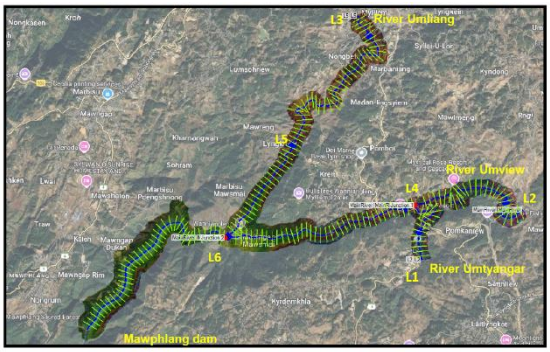

Figure 2 : 1D river schematic with cross-section locations on LiDAR survey data and bathymetry data

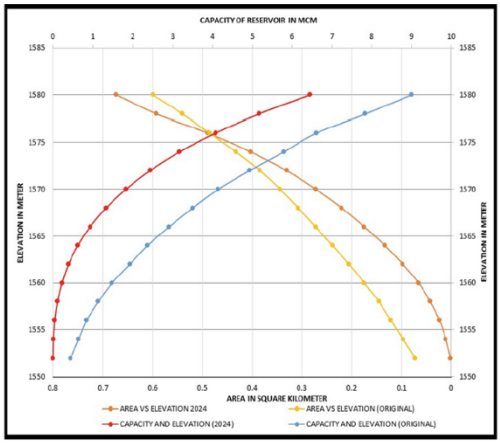

Figure 3 : Original and Revised EAC curve for Mawphlang reservoir

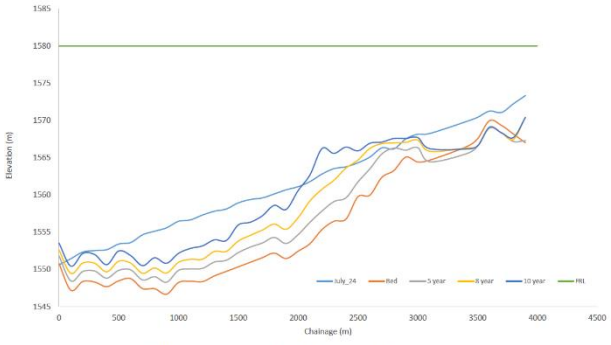

Figure 4 : Sedimentation Profiles for Mawphlang reservoir