



Presentation

by

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**DE-MYSTIFYING UMIAM LAKE**  
**DEGRADATION**

# INTRODUCTION

The Umiam Lake (Storage Reservoir of Umiam Stage –I HEP) is located on the Umiam River near Barapani town in the Ri-Bhoi District of Meghalaya. This project is the first stage in the series of cascade development planned on the rivers Umiam, Umtru and Khri, designed and constructed as a Hydro electric project to provide benefits of hydropower and drinking water supply. The five hydropower projects built by MeSEB, with Umiam stage I as the precursor, provide 185.2 MW of hydroelectric power (Energy 675.59 MU in the year 2001-2002) to the state of Meghalaya.

The main dam of Umiam Stage - I comprises a concrete structure of 195 m in length and 73.2 m in height above the deepest foundation with a spillway (two bays each of 12.2 m length) with crest level at E.L 969.5 m controlled by two gates of size 12.2 mx12.2 m designed to discharge a design flood of 1840 cumecs. The main earth dam is 463.4 m in length and 37.2 m in height above the deepest foundation. There is also a road dyke that is 167.7 m in length and 17.4 m in height above the deepest foundation level. For diversion of water into the powerhouse through a 2057.4 m long tunnel (horse shoe shape - diameter 3.05 m), an intake tunnel (a circular shaft of 3.05 m diameter and height 28.5 m) is provided with intake gates of 3.05 m x 3.05 m. The surface power house at Sumer at the end of the tunnel, surge shaft and penstocks, houses four turbo generating units of 9 MW capacity each (Total installed capacity 36 MW). The tailrace channel is 137.2 m in length - leads the water for Stage II development at Um Sumer Power station.



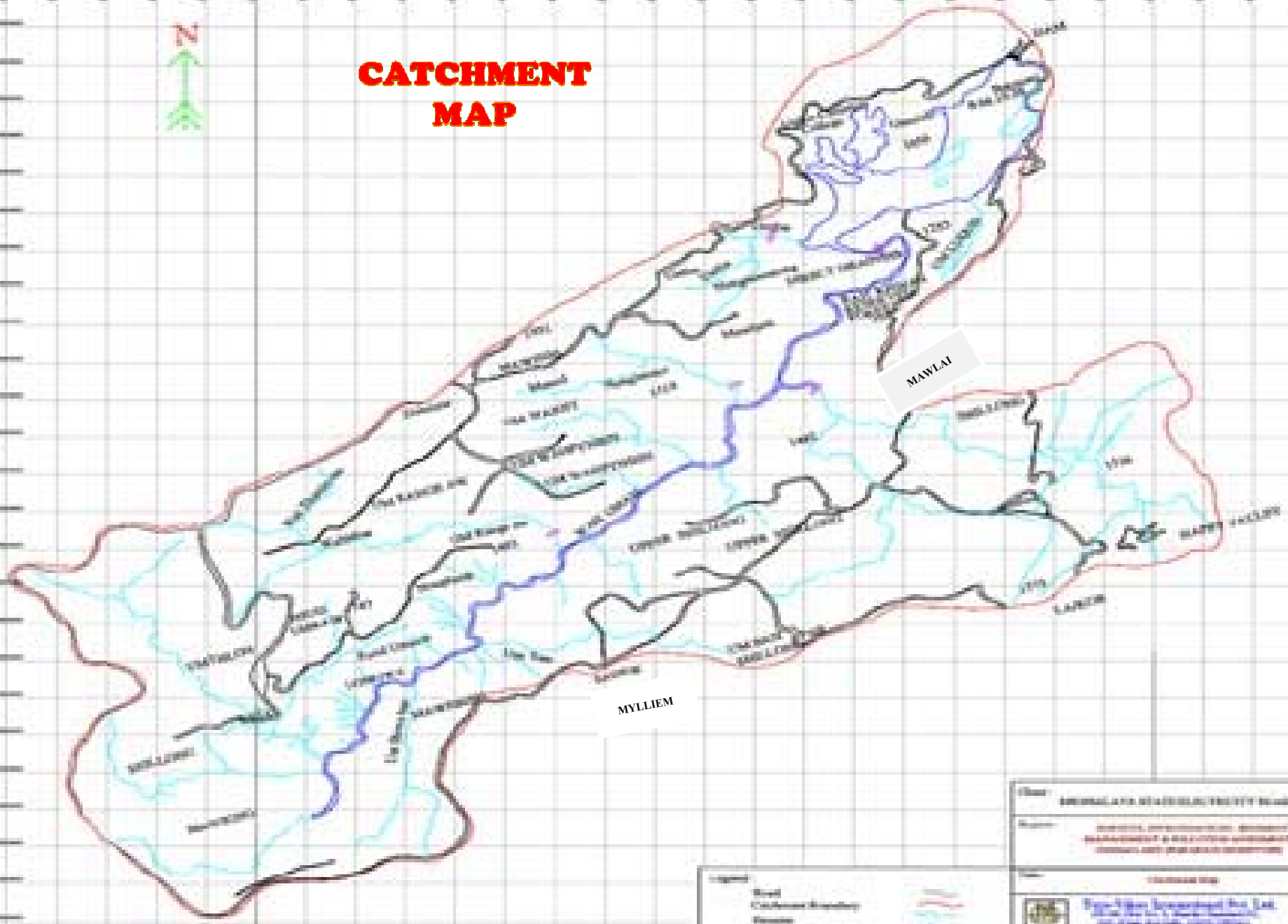
## Existing Hydropower Development in Meghalaya State

Sl No	Name of Power Station	Location	Unit	Capacity (MW)	Year of Commissioning
1	Umiam Stage I	Barapani/ Sumer	4x 9MW	36	1965
2	Umiam Stage II	Um Sumer	2x 9MW	18	1970
3	Umiam Umtru Stage III	Kyrdemkulai	2x30MW	60	1979
4	Umiam Umtru Stage IV	Nonkhylem	2x30	60	1992
5	Umtru	Dehal	4x2.8	11.2	1957

**TOTAL**

**: 185.2 MW**

# CATCHMENT MAP



Scale: 1:10000  
 Date: 15/05/2023  
 Prepared by: [Name]  
 Checked by: [Name]

Title: **WATER RESOURCES MANAGEMENT & PROTECTION PROJECT**  
 Objective: **WATER RESOURCES MANAGEMENT & PROTECTION PROJECT**  
 Prepared by: **Water Resources Management & Protection Project**  
 Date: 15/05/2023  
 Scale: 1:10000  
 Prepared by: [Name]  
 Checked by: [Name]

## **ENTRANCE OF THE UMIAM RIVER TO THE RESERVOIR**



# A VIEW OF UMIEW RIVER ENTRANCE





## Umiam River Basin

The drainage basin, extending over an area of 221.5 sq. km, lies entirely in the East Khasi Hills of the State of Meghalaya and comprises mainly of forests and agricultural land with a fragile ecosystem. The capital city of Shillong, the most important urban center, is located in the heart of the basin. Shillong urban agglomerate at the head of the Umiam reservoir, drains an area of about 25.4 sq km of the Greater Shillong city. The important tributaries of the Umiam river are the Wah Umkhras and the Umshyrpi, which flow through the city of Shillong from East-South towards West-North directions, join together below the city limits to form the Wah Roro river before joining the Umiam river further downstream, feeding the Umiam Lake. The Umiam River ultimately joins the Brahmaputra River.

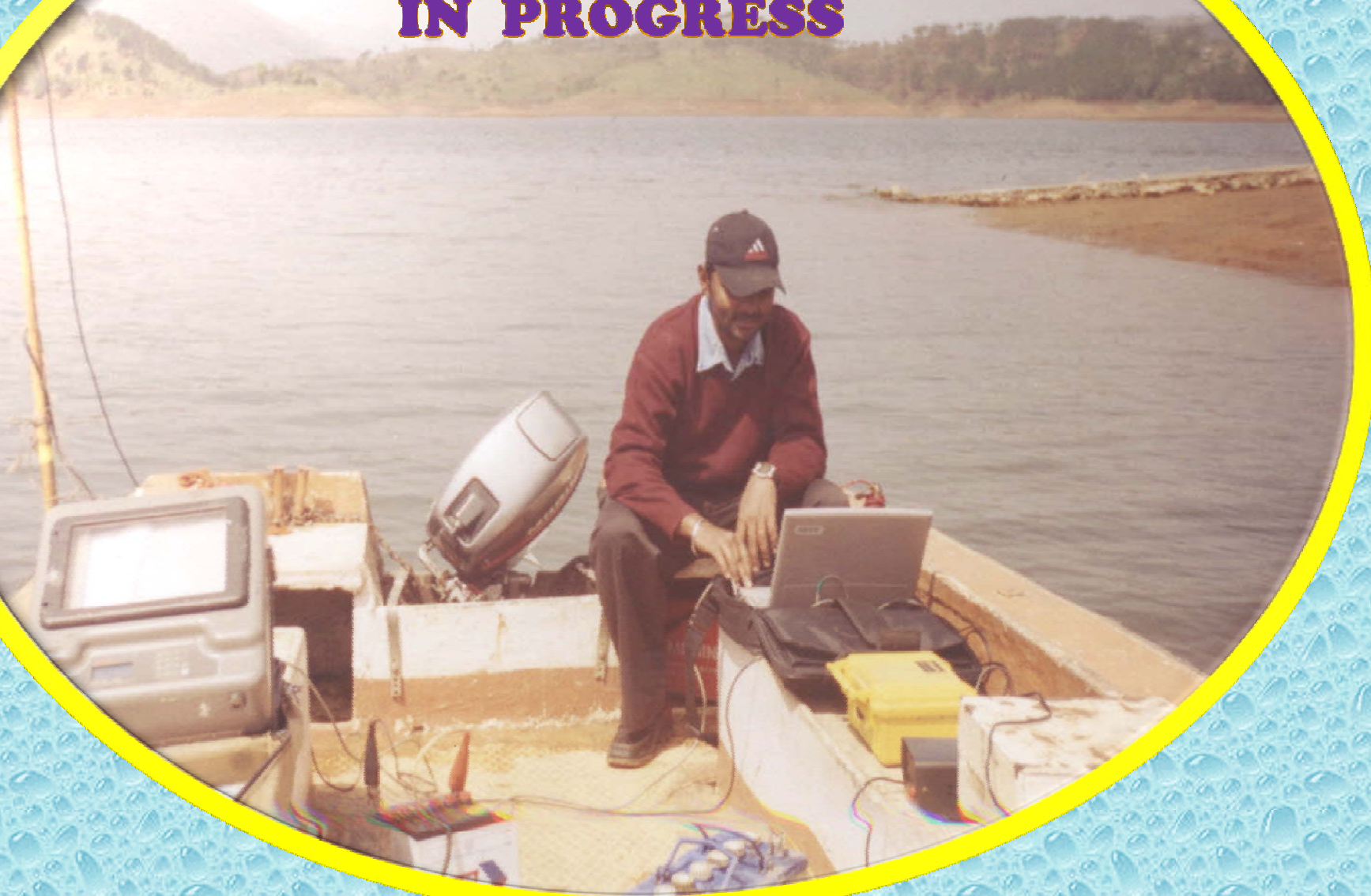


First survey of the Umiam reservoir after impoundment in 1965 was carried out by WAPCOS in 1990. As per this Report, the gross capacity of the reservoir has reduced from 179.757 Mcum at FRL 981.456 m to 167.069 Mcum over a period of 25 years (1965 – 1990) indicating an average rate of sedimentation of 26.1 Ha m/100 sq.km/year.

Second Hydrographic and Topographic surveys of the reservoir were carried out in April 2004 by TVIPL using the state-of-the-art high-tech instruments of Differential Global Positioning System (DGPS), Digital Echo-sounder and Electronic Total Station supplemented by Analogue echo sounder. The silt samples and water samples were collected using grab sampler and Nelson bottle sampler respectively, covering the entire reservoir area.



# **HYDROGRAPHIC SURVEY IN PROGRESS**



**HYDROGRAPHIC SURVEY IN PROGRESS**

