

MARSEILLE  
DU 27 MAI  
AU 3 JUIN  
**2022**



ICOLD  
27<sup>TH</sup> CONGRESS  
90<sup>TH</sup> ANNUAL  
MEETING



CIGB  
27<sup>ÈME</sup> CONGRÈS  
90<sup>ÈME</sup> RÉUNION  
ANNUELLE



Committee G Environment –

Case studies involving planning, construction and operation of dams demonstrating environmental and social benefits

# THE STORY OF THE ELAN VALLEY DAMS

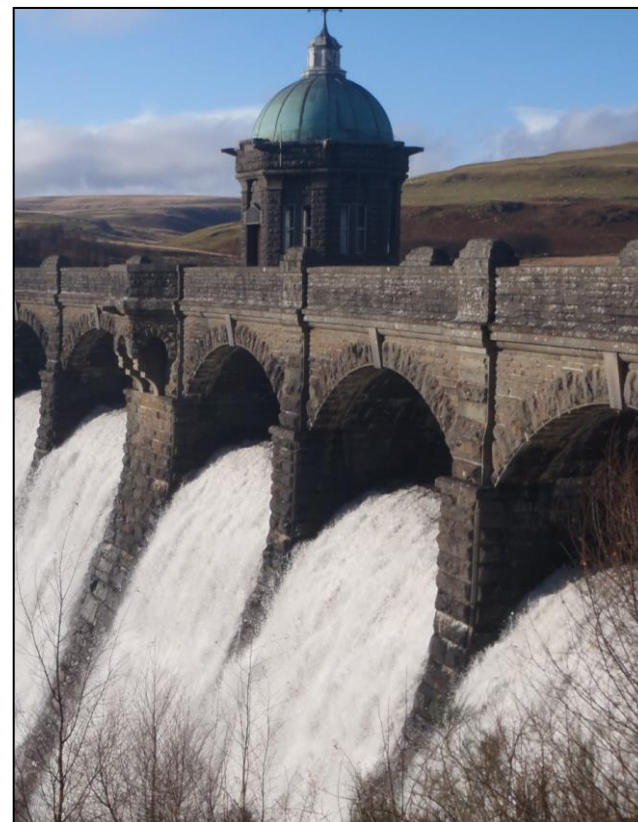
## From water supply to industrial heritage, recreation and nature conservation

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**GHD**



# Summary of the Elan Valley Dams Story

- The case study describes:
  - The original purpose and construction of the dams
  - Impacts to stakeholders and communities
  - Environmental and social benefits
  - Measuring success

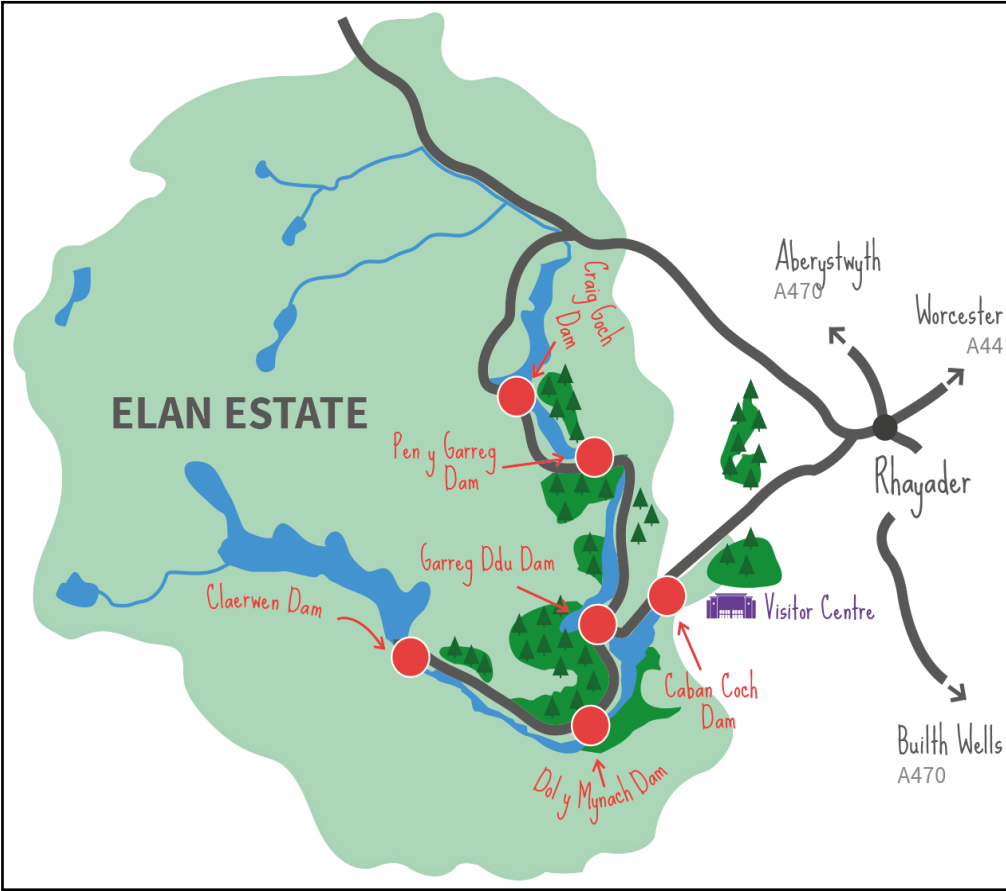


# The original purpose of the dams

- During 19<sup>th</sup> century, the city of Birmingham grew rapidly
- Clean water was in short supply
- Major epidemics of water-borne diseases including typhoid, cholera and diarrhoea
- Act of Parliament passed in 1892 for compulsory purchase of the water catchment area in the Elan and Claerwen Valleys (180 km<sup>2</sup>)
- Six dams built to supply water via a 117.5 km aqueduct



# Location of the Elan Valley





# Why the Elan Valley

- Average annual rainfall of 1830 mm
- Narrow downstream valleys
- Impermeable bedrock
- The altitude - enabling water to be transported entirely by gravity





# The six dams



Craig Goch



Pen y Garreg

Dol y Mynach



Caban Coch



Garreg Ddu



Claerwen





# Dam construction

- 1893-1904: Elan Scheme
  - Craig Goch, Pen y Garreg, & Caban Coch – 37 m high cyclopean concrete dams
  - Garreg Ddu: Submerged dam provides low water storage & access to Claerwen
  - Dol y Mynach: The base was built early (below Craig Goch top water level)
- 1946-1952: Claewen Scheme
  - Claerwen – 56 m high concrete gravity dam



Dol y Mynach



# Impacts to stakeholders & communities

- **Resettlement:**

- Approx. 100 residents relocated from 21 properties and farmland
- Church, chapel, shop and school were lost
- New village was built including 35 properties
- The church, chapel, shop and school were rebuilt
- Additionally a library, public hall, pub and hospital were built





# Environmental and social benefits

- **Water supply:**
  - Up to 160 Ml/day supplied to Birmingham
- **Energy production:**
  - Micro-turbines installed since 1997 provide a total hydropower output of 4.2 MW



Caban Coch



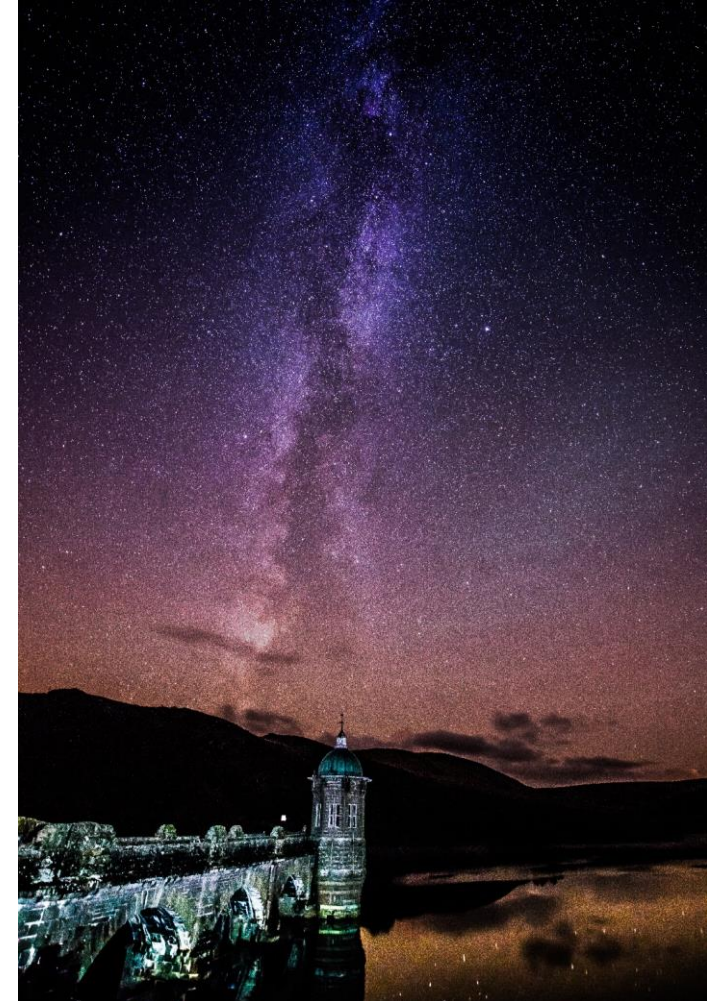
# Environmental & social benefits

- **Socio-economic benefits:**

- Visitor Centre employs approx. 20 staff with an annual turnover of £0.5 M
- £0.5 M goes into the local economy each year from guest houses and eateries

- **Tourism and recreation:**

- Stargazing - designated a European “Dark Sky Zone”
- Cycling, walking & horse riding - 120 km of tracks
- Fishing - major championships held in the valley



# Environmental & social benefits

- **Public education:**

- The Visitor Centre arranges Dam Open Days
- Museum with information on the dams & environment
- Artists display their work at the Visitor Centre exhibitions

- **Cultural heritage:**

- 38 designated historical sites
- 'Dambuster walks' to the WW2 test site for the raids





# Environmental and social benefits

- **Environmental benefits:**

- Over 80% of the valley is designated as national and international protected environmental sites for flora, fauna & geological historical importance

- **River compensation and enhancement:**

- Abstractions & releases to the reservoirs are monitored to maintain & improve the environment



# Measuring success

- Until recently, little scientific factual evidence
- In 2018, research was undertaken to create a visitor profile:
  - Over 200,000 visitors
  - Rated 2<sup>nd</sup> of the attractions in Mid Wales
- It was planned to understand visitor needs, with the aim to attract almost twice as many visitors to the area by 2025
- This research provides a baseline against which future performance can be measured and benchmarked



# Measuring success

- Measuring the benefits of dams is becoming more important and considered good practice across the world

*This type of research provides an important source of information to support continual improvement in the socio-economic benefits of dams*





# Thank you

