

DAMS 2.0

Design and Assessment of resilient and sustainable interventions in water-energy-food-environment Mega-Systems



Prof David Hulme
UM Global
Development
Institute



Prof Julien Harou
UM Engineering



Prof Alice Larkin
UM Tyndall
Centre for
Climate Change



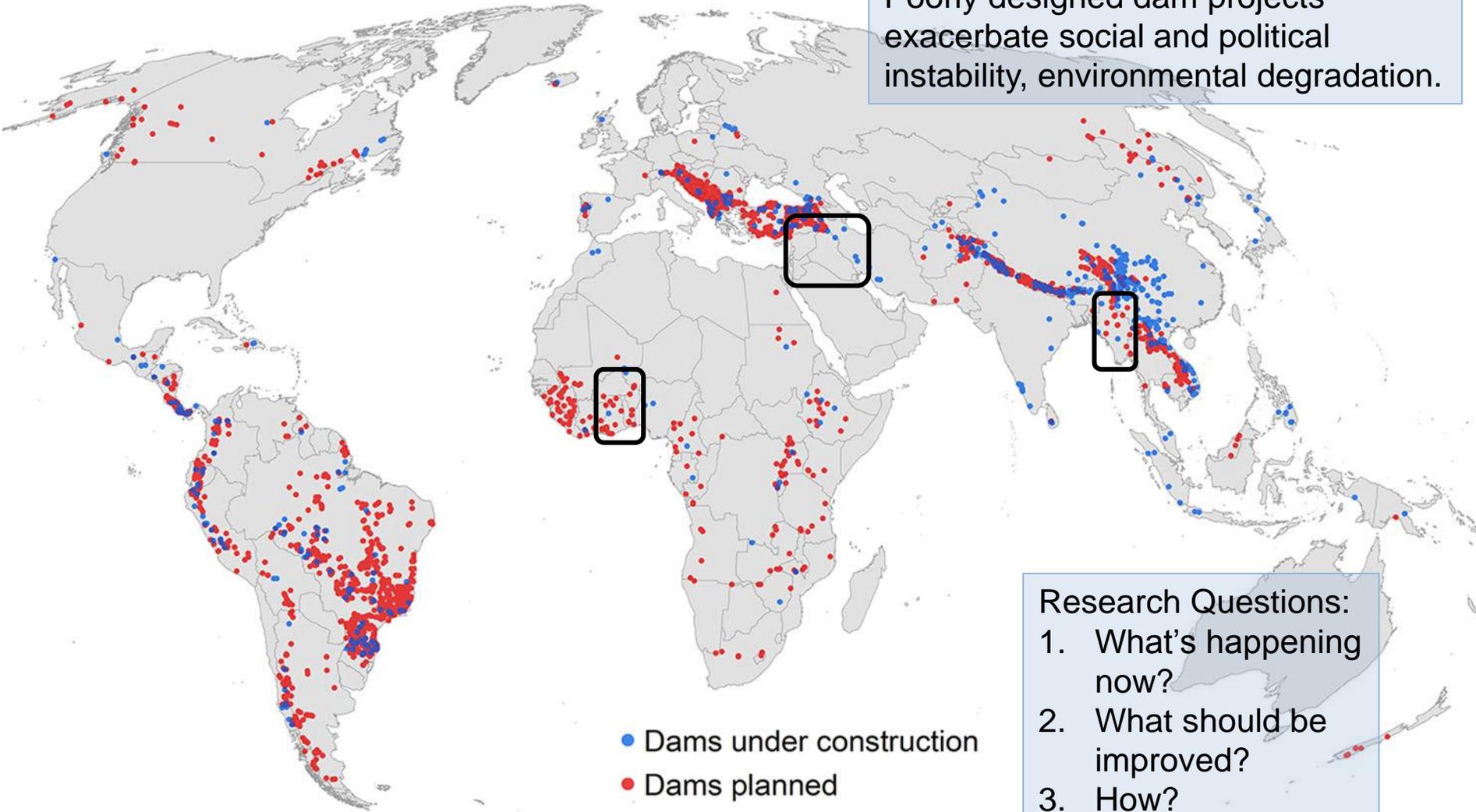
Dr Emmanuel
Obuobie,
Council for
Scientific &
Industrial Research
(CSIR), Ghana



Mr Jamie Skinner
International
Institute for
Environment &
Development (IIED)

A Global Boom in Hydropower Dam Construction

New dams have the potential to contribute to SDGs. Poorly designed dam projects exacerbate social and political instability, environmental degradation.



Research Questions:
1. What's happening now?
2. What should be improved?
3. How?

Aim and Objectives

Rapid DAC country achievement of Sustainable Development Goals by selecting, designing, financing and managing dam systems to meet local, national and regional development needs – Paris compliant

- Understanding of nexus systems
- Long-term x-disciplinary network
- Building institutional capacity

Achieving Our Aim – 3 Pillars

1. Research

- World-leading

2. High impact applications

- Collaboration with established partners

3. Building capacity, capability and legacy

- Partnerships (WB, IUCN, TNC, IWMI, IHA, ...)
- Web-based open-source tools & training
- Co-production through case-studies

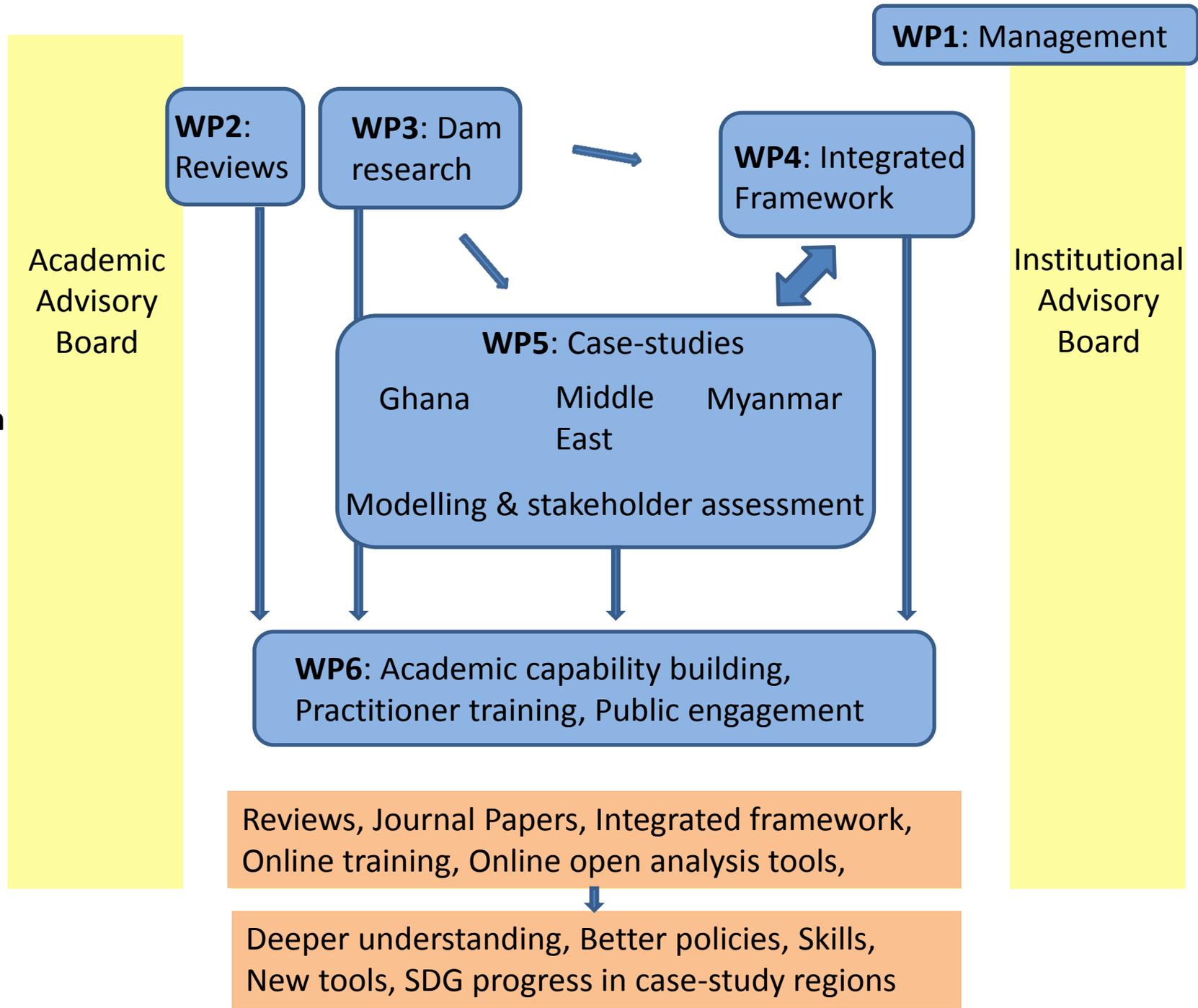
Science

Application

Capacity

Outputs

Outcomes



DAMS 2.0 Researchers

P.I. : D. Hulme

Capacity Development Lead: J. Skinner

Research Lead: J. Harou

- **Prof David Hulme**
- Prof Bill Adams (Cambridge)
- Dr Tom Lavers
- **Dr Abdul Gafaru (GBS)**

Governance, political science & development

Finance & climate change policy

- **Prof Alice Bows-Larkin**
- Jake Reynolds (Cambridge)
- Clare Shakya (IIED)
- Prof. Kevin Anderson

DAMS 2.0:
Design & Assessment
of water-energy-food-
environment system
Interventions in
Mega-Systems

Economic analysis

Systems engineering & decision-making under uncertainty

- **Prof Julien Harou**
- Prof Pierluigi Mancarella, Dr Mathaios Panteli, Dr Joseph Mutale,
- Dr Tim Foster
- Dr Tohid Erfani (UCL)

Climate, hydrology & hydro-ecology

Social impacts

- **Prof Andy Norton (IIED)**
- Jamie Skinner (IIED)
- Prof Nigel Gilbert (Surrey)

- **Prof Kunal Sen**
- Prof Dale Whittington
- Dr. Alvaro Calzadilla Rivera (UCL)
- Dr Afzal Siddiqui (UCL)
- Dr Ralitzia Demova
- **Prof Manoj Panda (IEG)**

- **Prof Hayley Fowler (Newcastle)**
- Prof Justin Sheffield (Southampton)
- Prof Mike Acreman (CEH)
- **Emmanuel Obuobie (CSIR)**

(Researchers at Univ. Manchester if not specified)

Volta basin Case-study
Dr Joseph Ampofo
CSIR-Water

Myanmar Case-study
Prof Aung Ze Ya
Tech. University Yangon

Middle East Case-study
Prof Samer Talози, Jordanian
Inst. of Science & Technology

Case-studies Building on High Impact Collaborations

Partner

Lead

Past projects

Ministerial-level policy-maker access

Ghana:
Council for Scientific & Ind. Research, University of Accra



Dr Joseph Ampofo

- WISE-UP: Water Infrastructure Solutions From Ecosystem Services for Climate Resilient Policies, £3.5M (German Gov't, BMU); Since 2013
- GDI Effective States & Inclusive Development Research Program, £9.3M (DFID); Since 2011



(World Bank, IUCN, IHA)

Middle East:
Jordanian Univ. of Science and Technology



Prof Samer Talози

- Jordan Water Project (with Stanford University); £1.1M (NERC-Belmont Forum); Since 2014
- Mesopotamia Water management project; £350K (UN FAO); Since 2012



(IUCN, FAO, Minister)

Myanmar:
Technical University Yangon



Prof Aung Ze Ya

- MULTI-STOR project with TNC; £0.5M (Dutch Gov't); Since 2016
- TNC-Manchester study in Myanmar; £100K (DFID); Since 2016



(TNC, DFID)

Management

- Track record
- Proven structures (SMT, RMT, PAF, AAB)
- World-leading Academic Advisory Board to *ex ante* review and *ex post* evaluate programme
- Flexible partnerships: Y1 work will determine if team changes needed

Dams 2.0

A world in which developing/DAC countries make rapid progress to achieving the Sustainable Development Goals by selecting, designing, financing and managing dam systems to meet local, national and regional development needs (and help meet the Paris Agreement on climate change)

Institutional Advisory board for Global Policy Impact

IUCN (International Union for the Conservation of Nature)

The World Bank

TNC (The Nature Conservancy)

IHA (International Hydropower Association)

Climate Bonds Initiative

IFC (International Finance Corporation)

EIB (European Investment Bank)

EBRD (European Bank for Reconstruction and Development)

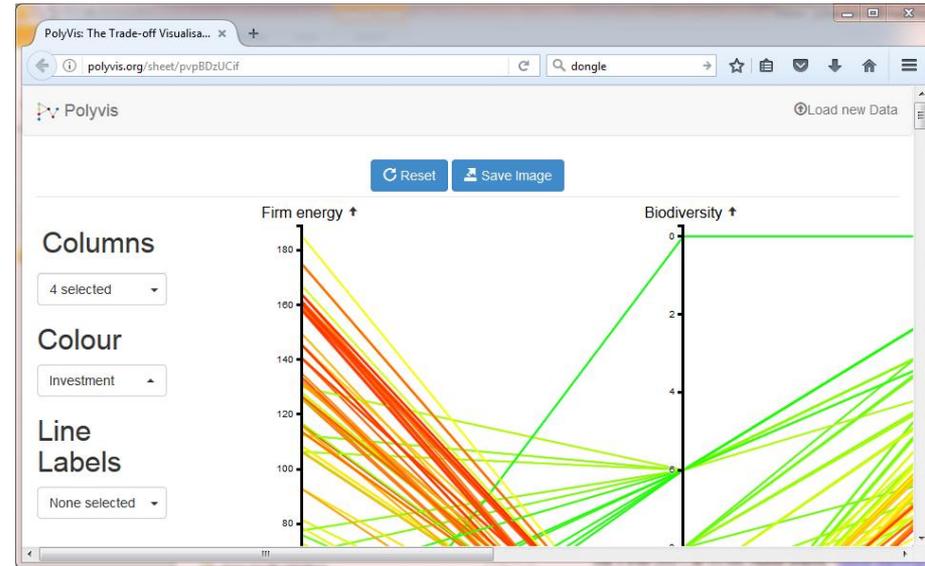
UNECE (U.N. Economic Commission for Europe)

FAO (U.N. Food and Agriculture Organisation)

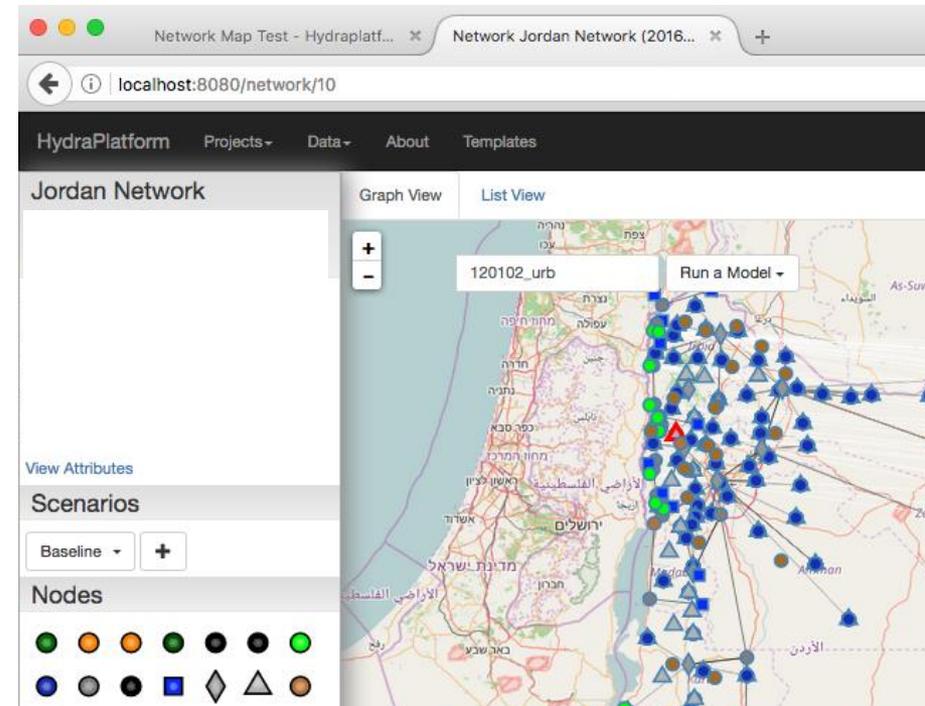
UK Academia-Industry partnership transforming global practice

Online open-source system of systems simulation & decision analysis

Online training



With Atkins, HR Wallingford, CH2M, Mott McDonald, Arup

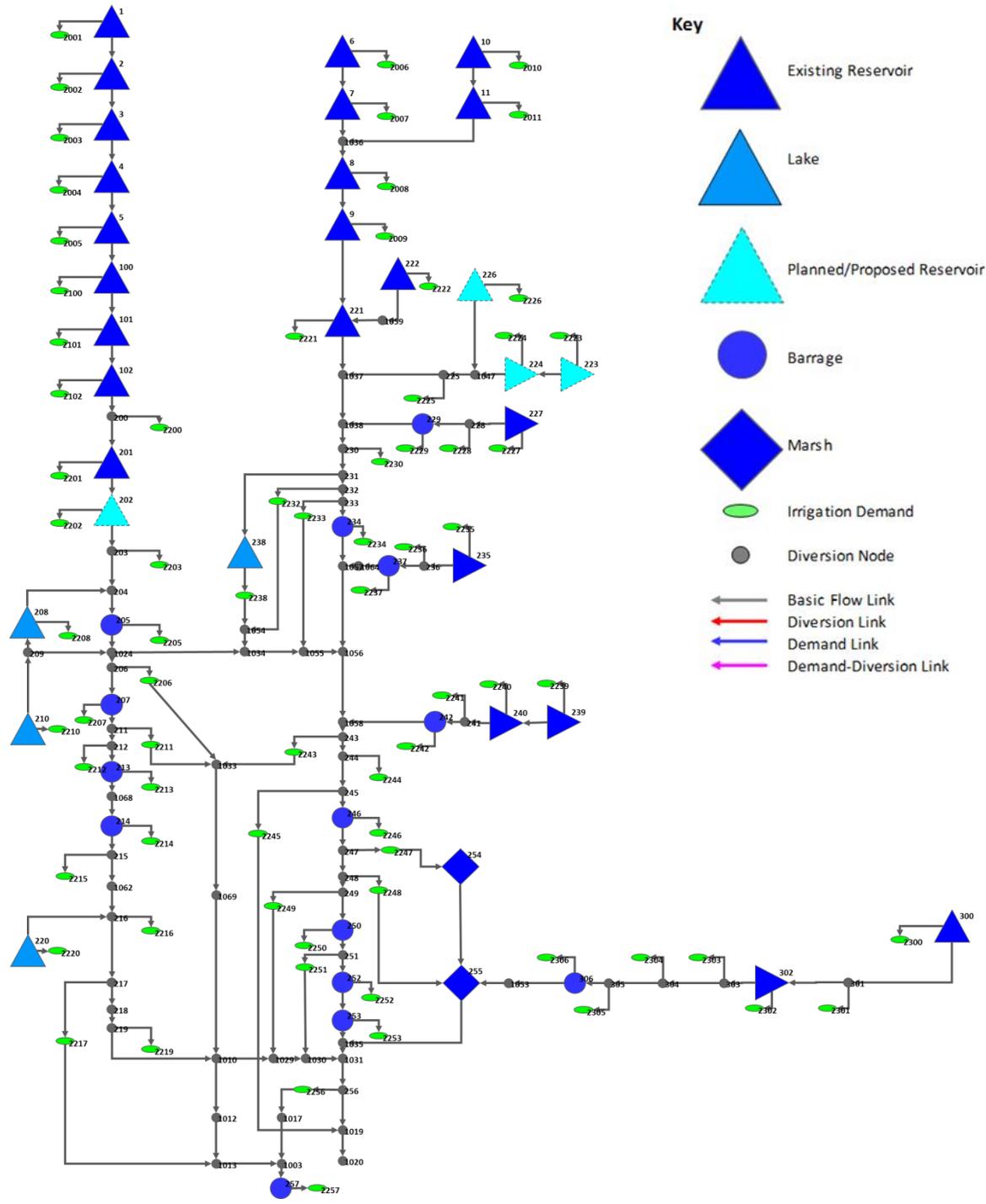


Tigris – Euphrates water system

U.N. Food and Agriculture Organization (FAO) funded study

Collaboration with Iraq, Syria, Iran, Turkey

Univ. Manchester, JHU, Laval



Research Questions

- ***What's happening now?*** Who is selecting, designing, and financing dams and systems of dams today? what approaches/tools do they use? what shapes and incentivises decisions about dam selection & operation?
- ***What should be improved?*** What technical and political knowledge is required for new dams to maximise and appropriately allocate nexus benefits, promote resilient and sustainable development, and minimise conflict and socio-ecological loss? what participatory decision processes need designing/improving?
- ***How?*** What skills, approaches, processes, tools and networks will help create a new generation of engineers, social scientists and policy analysts in the UK, case study countries & beyond to achieve our mission?