The safe operation of dams has significant social, economic, and environmental relevance given the considerable portfolio of ageing large dams worldwide.

Dam safety is unique in that it represents a low-probability event with severe consequences or hazard risks. Dam failures, however rare, can result in extreme adverse impacts, including a large-scale loss of human life. For countries with large stocks of dams, the existence of appropriate and effective legal, regulatory and institutional frameworks is critical.

This workshop focused on the essential elements of the regulatory regime and specific approaches to risk management, as covered in the ongoing study ‘Comparative study of the legal and institutional frameworks for dam safety management’, being carried out by the World Bank and the University of South Australia.

The workshop featured three examples from a sample of the 51 country case studies in the report, and explored the range of options available to countries for effective dam safety management.

Speakers
- Kimberly Lyon, water resources management analyst, World Bank Group
- Satoru Ueda, lead dam specialist, World Bank Group
- Ato Kebede, state minister, Ministry of Water, Irrigation and Energy
- Chen Guanfu, executive vice president, POWERCHINA
- Mohamed Amahdouk, hydraulic administration, Ministry of Energy, Morocco
- Bill Girling, hydropower development director, International Hydropower Association (IHA, moderator)
Key discussion points

The World Bank gave an overview of dams and historical trends around the world, followed a review of recent dam failures and incidents. This served to highlight some systematic dam safety issues.

Kimberly Lyon introduced the World Bank’s portfolio and the types of support available for dam safety (lending, technical assistance). She highlighted how the World Bank is trying to address dam safety issues, and help enhance its clients’ overall systems and capacity.

Finally, she discussed some of the typical dam safety issues observed in World Bank client countries. She described how the bank is trying to address these issues, either on a project basis or through broader dam safety management system/capacity-building activities.

The World Bank is trying to address dam safety issues, and help enhance its clients’ overall systems and capacity

The ‘Global Comparative Dam Safety Study’ was introduced, with case study countries, phases and outputs. The study elaborates on six key topics, along with key sub-topics being assessed through 51 country case studies:

1. Legal basis for dam safety responsibility and legislation: types of legal system (civil law or common law); possible level(s) of law-making for dam safety (national only or federal/state/provincial); laws defining dam safety; and legal responsibility for dam safety (dam owner, manager, regulator or mixed).
2. Governance and institutional arrangements for dam safety assurance: regulators vs owners/operators; ownership (public, semi-public, or private); and administration levels.

3. Regulatory schemes: scope and definition of regulated dams; dam classification and the associated level of safety requirements; issuance of licenses/permits for constructing dams regarding dam safety and third-party review mechanism; design standards/criteria under regulations or reference to other standards; compliance monitoring (including enforcement strength); and reporting and auditing procedures.

4. Funding mechanisms for dam safety: sources of funding for the administration of the dam safety regulatory scheme; operations and maintenance budget sources and adequacy; cost allocation; cross-subsidies between different purposes in case of multipurpose dams; and funds for periodic major rehabilitation works and safety upgrades.

5. Operations and maintenance: corporate governance; portfolio risk management; and institutional capacity.

6. Emergency Preparedness Plan (EPP) and Dams on Transboundary Rivers

Three case studies were presented to offer an overview of the current state of dam safety legislation and dam safety practices in Ethiopia, China and Morocco. They addressed the unique institutional challenges each of these countries is facing in terms of implementing dam safety guidelines and emergency preparedness plans (EPP). The challenges were quite similar in all three cases, including: insufficient monitoring and data analysis; low frequency of inspection; lack of regulation; no specific dam safety legislation; and a lack of finance for operations and maintenance.

The case studies illustrated the need for a number of measures, including: a more detailed regulatory framework; the formation of advisory panels; sustainable finance for construction; risk-informed approaches; portfolio risk management (moving away from a traditional standard-based approach); and continued financial assistance from the World Bank and other lending institutions.

Other lessons learned during the workshop included: the need to address risk properly; the importance of setting appropriate safety criteria; building local knowledge; and the need to bring in international experience for preparing operations and maintenance plans.
Key outcomes
Discussions in the workshop highlighted the following:

• A lack of ministerial cooperation can jeopardise well-intended projects;
• There is a need for better communication in case of emergency situations to ensure that support is delivered promptly and efficiently. International organisations can help develop guidance for crisis situations.
• It is important to carry out regular equipment maintenance in order to avoid catastrophic events.
• Specific regulatory schemes for dams are not always present, but they’re not always necessary. In New Zealand for example, the Building Act of 1991 does not have any provisions dealing with dam safety, but with building safety in general.
• Due to a lack of permits issued, owners of dams are often left fully responsible.
• Funding is needed to support maintenance and safety. This is particularly relevant in countries with less hydropower.

There is a need for better communication in case of emergency situations

• There is a general lack of ministerial and overall cross-sectoral collaboration.
• Further capacity-building and collaboration is needed between stakeholders.
• More preparation is required, to be supported by the introduction of a financial mechanism
• There should be a bridging of opportunities between communities and governments.

What next?