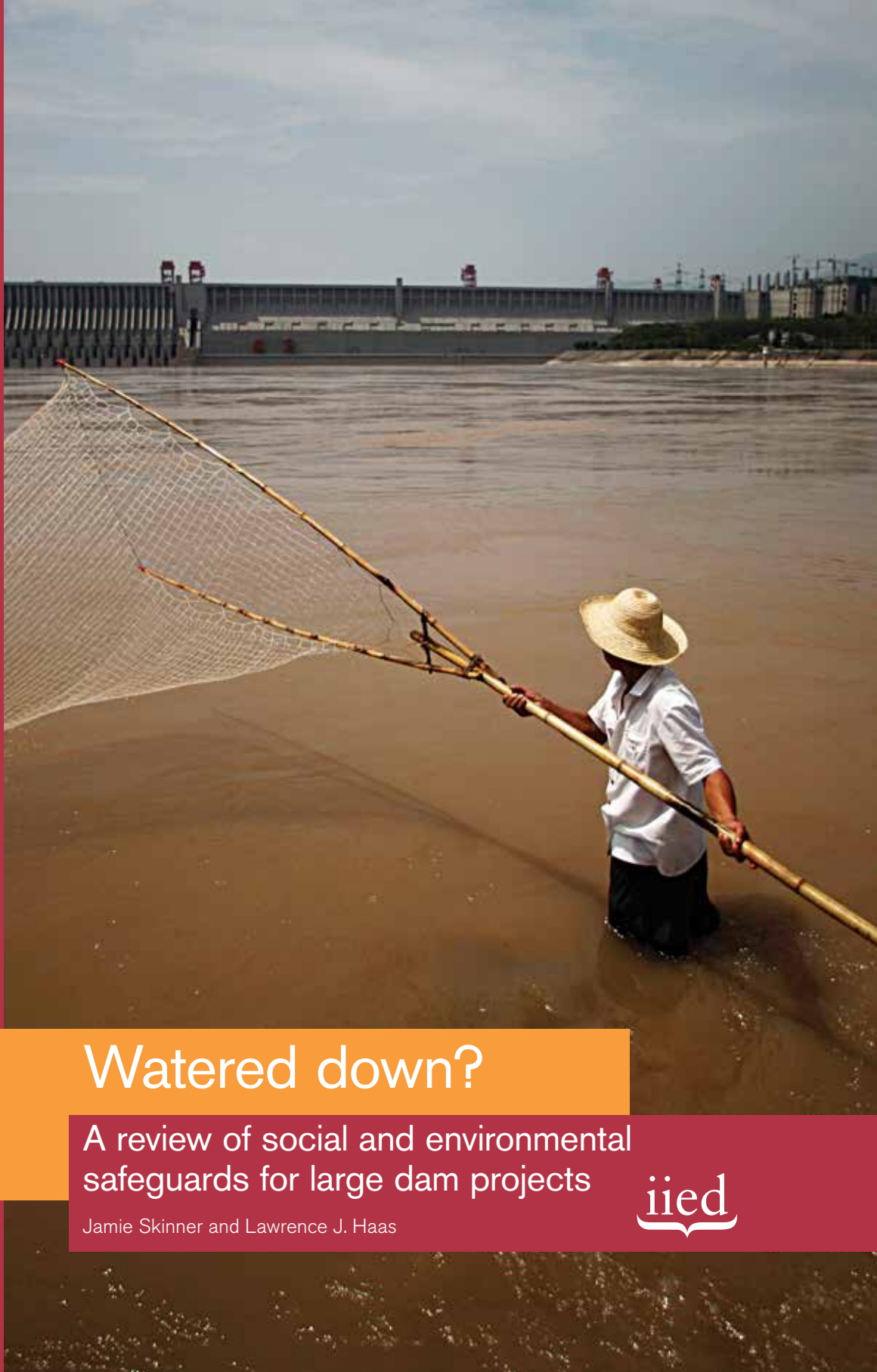

Watered down?

A review of social and environmental safeguards for large dam projects

Jamie Skinner and Lawrence J. Haas

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Contents

Acknowledgements iv
Acronyms v
Executive summary viii

1 Introduction 1
1.1 International context 1
1.2 Structure and purpose of the report 3
1.3 Dams of different kinds, financed in different ways 5

2 Large hydropower: the planning and funding landscape 7
2.1 Typology of environmental/social criteria and standards 7
2.2 Past and recent hydropower and dam trends 10

3 The World Commission on Dams – approach and intent 21
3.1 The World Commission on Dams process and report 21
3.2 The commission's intentions 25

4 The Hydropower Sustainability Assessment Protocol 27
4.1 The HSAP and WCD compared 30
4.2 WCD provisions not fully reflected in the HSAP (preparation phase) 40
4.3 Comparing the WCD and HSAP approaches 41

5 Safeguard policies of the multilateral system and investment banking 45
5.1 Multilateral banks 45
5.2 World Bank safeguard coherence with the WCD 48
5.3 The Equator Principles 49
5.4 From safeguards to implementation 53

6 Sustainable hydropower opportunities in a low-carbon strategy 55
6.1 Hydropower greenhouse gas emissions – gross and net 55
6.2 Hydropower and carbon financing 57
6.3 Do run-of-river schemes offer reduced impacts? 60
6.4 What evidence for the 20 megawatt limit? 64

7 Application of the WCD framework 67
7.1 How the WCD is used or applied 67
7.2 The EU Linking Directive 68
7.3 River basin and regional approaches to good practice 70
7.4 Respect for the WCD provisions – overall assessment 71

8 Conclusions 75

References 82

Annexes 89
Annex 1 Global trends influencing hydropower, standards and the carbon outlook 89
Annex 2 Example of an HSAP topic – P1 Communication and Consultation 102
Annex 3 World Bank safeguards and the WCD 104
Annex 4 River basin approaches 109
Annex 5 Review of EU template for WCD compliance under CDM 112
Annex 6 Extract from IFC Performance Standard 1 126
Annex 7 Extract from OECD Council recommendation 128

List of Tables

Table 1. Typology of voluntary and mandatory standards and guidelines 9
Table 2 Hydropower investment from different sources 15
Table 3 Topics for the HSAP Preparation Stage 34
Table 4 Analysis of topics for the Preparation Stage against the WCD 34
Table 5 Overview comparison between WCD and HSAP 39
Table 6 HSAP assessments available as at 30 Nov 2013 43
Table 7 Coverage of risk areas by MDB safeguards 46
Table 8 Comparison of World Bank and WCD topics 46
Table 9 Comparison of IFC and World Bank safeguards 53
Table 10 Proportion of run-of-river schemes in CDM-supported hydropower projects 56
Table 11 Hydropower (CDM) database showing status by region 58
Table 12 CDM status by project type (to end of 2012) 59
Table 13 Categories of hydropower plant by size (IRENA) 64
Table 14 Definitions of 'small hydro' worldwide 65
Table 15 Illustrative UK actor map regarding hydropower, carbon financing and support to developing countries 101
Table 16 Types of support the UK extends to hydropower and large dams 101
Table 17 World Bank safeguard policy – general objectives 105
Table 18 Mapping of WCD Strategic Priorities and World Bank Safeguard Policies 106
Table 19 Environmental and social safeguard policy objectives and operational principles 107
Table 20 Key WCD concepts and their EU template equivalent 114

List of Figures

Figure 1 Standards applicable to financing hydropower and dam projects 8
Figure 2 Global hydropower capacity additions by region in 2012 10
Figure 3 Global distribution of dam reservoir volume, 2000 11
Figure 4 Global breakdown of large dams by purpose 11
Figure 5 Decision-making framework proposed by the WCD 22
Figure 6 Example of a WCD Strategic Priority: SP1 – Gaining Public Acceptance 23
Figure 7 The four key phases to which the HSAP applies 28
Figure 8 WCD Strategic Priority 2: Comprehensive Options Assessment 31
Figure 9 Spider diagram for HSAP assessment of Hvammur hydropower project (preparation stage) 43

Figure 10 Spider diagram for HSAP assessment of Trevallyn, Tasmania (operation stage) 44
Figure 11 Number of EPFIs 51
Figure 12 Value of EPFI loans 51
Figure 13 Supervision of safeguards in World Bank-financed projects by region 54
Figure 14 Environmental and social impacts of large ROR hydropower schemes 62
Figure 15 The WCD in context 67
Figure 16 Geographical distribution of UK-approved EU carbon credits for hydropower projects 70
Figure 17 Integrating planning/regulation in the water and power sectors to achieve sustainable outcomes with hydropower and dams 110

List of Boxes

Box 1 The World Bank and hydropower 13
Box 2 Major funding streams for hydropower for developing countries 17
Box 3 The World Commission on Dams 21
Box 4 Application of guidelines during a WCD Stage 1 Needs assessment 24
Box 5 The Hydropower Sustainability Assessment Protocol (HSAP) 28
Box 6 African Development Bank operational guidelines under review 47
Box 7 Assessing the World Bank safeguards: International Rivers Network 48
Box 8 The Equator Principles 50
Box 9 Nordic hydropower complements Danish wind power to achieve lower regional emissions 63
Box 10 The limitations of relying on run-of-river alone: the implications for Nepal 64
Box 11 Field review of WCD compliance for projects receiving credits 72
Box 12 Extract from WCD compliance report for Xiaoxi Dam, China 73
Box 13 Elements of global power-sector reform relevant to hydropower 91
Box 14 China's lending increases 92
Box 15 Financing for the Lom Pangar Hydropower Project (Cameroon) 94
Box 16 Financing the Nam Theun 2 Hydropower scheme in Laos 94
Box 17 Sources of financing for hydropower suggested in India 96

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Acronyms

ADB	Asian Development Bank
AFDB	African Development Bank
BP	Bank procedure (World Bank)
BRICS	Brazil, Russia, India, China, South Africa
CDC	Commonwealth Development Corporation
CDM	Clean Development Mechanism
CER	Certified emission reduction
DECC	Department of Environment and Climate Change (United Kingdom)
DFP	Designated Focal Point
DNA	Designated National Authority
E&S	Environmental and social
EBRD	European Bank for Reconstruction and Development
ECA	Export credit agency
ECB	External commercial borrowing
ECDG	Export Credit Guarantee Department (United Kingdom)
ECOWAS	Economic Commission of West African States
EFA	Environmental flow assessments
EHS	Environmental, health and safety guidelines
EIA	Environmental impact assessment
EIB	European Investment Bank
EP	Equator Principles
EPFI	Equator Principles financial institution
ERPA	Emission Reduction Purchase Agreement
ESA	Environmental and social assessment
ESCIR	Ecosystem Research Centre for International Rivers (China)
EU	European Union
EU ETS	European Union Emissions Trading System
EXIM	Export-import bank
GDP	Gross domestic product
GHG	Greenhouse gas
GP	Good practice (World Bank)
HSAF	Hydropower Sustainability Assessment Forum
HSAP	Hydropower Sustainability Assessment Protocol
IADB	Inter-American Development Bank
ICOLD	International Commission on Large Dams
IEA	International Energy Agency
IEG	Internal Evaluation Group
IFC	International Finance Corporation
IHA	International Hydropower Association
INGO	International non-governmental organisation
IRN	International Rivers Network
IRR	Internal rate of return

ISO	International Organization for Standardization
ISS	Integrated safeguard system
IWRM	International Water Resources Management
M&E	Monitoring and evaluation
MDB	Multilateral development bank
MFI	Multilateral financial institution
MFI-WGE	Multilateral Financing Institutions Working Group on Environment
MIGA	Multilateral Investment Guarantee Agency
MRC	Mekong River Commission
MTOE	Million tonnes of oil equivalent
NGO	Non-governmental organisation
NORAD	Norwegian Agency for Development Cooperation
OD	Operational directive (World Bank)
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
OP	Operational policy (World Bank)
PCA	Project concession agreement
PCR	Physical cultural resources
PDA	Project development agreement
PDG	Preliminary Design Guidance
PES	Payment for ecosystem services
PNPCA	Procedures for Notification, Prior Consultation and Agreement
PPA	Power purchase agreement
PRC	People's Republic of China
ROR	Run of river
RSAT	Rapid Sustainability Assessment Tool
SEA	Strategic environmental assessment
SP	Strategic priority (World Commission on Dams)
UN	United Nations
UNEP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
VER	Verified emission reduction
WBG	World Bank Group
WCD	World Commission on Dams
WWF	World Wide Fund for Nature

Executive summary

Hydropower is back in the spotlight as a mitigation and adaptation response to climate change. This has led to a resurgence of attention on the environmental and social impacts in decisions to finance and support hydropower and large dams.

Recent global trends in the financing of large dams underlie this resurgence. For example, World Bank lending for hydropower increased four-fold from a three-year average of US$250 million per year in 2002-04 to US$1 billion by 2008. The World Bank Group suggests annual lending of US$2 billion for hydropower projects will be possible in the coming years. China has also recently emerged as the largest single financer of large hydropower schemes in developing countries.

This review seeks to clarify the evolving context for international support for large hydropower in developing countries, and the links to international carbon financing as a perceived route to climate change mitigation, including carbon trading systems. It aims to synthesise information on the relative coherence of the different safeguards, approaches and standards applied to large hydropower projects to enhance social and environmental performance, and sustainable outcomes more broadly. It recommends some initial steps to help assess the coherence of these standards in respect to any consideration of financial or other support for new large hydropower schemes.

This review was undertaken primarily as a scoping exercise, and therefore addresses a broad range of issues that stakeholders consider important. It describes the funding landscape, where an underlying question is the degree to which the decision-making framework created by the World Commission on Dams advances – or constrains – opportunities for hydropower development. It focuses mainly on large hydropower, identifying the roles of the voluntary guidelines and mandatory standards that stem from national legislation, river basin agreements, funding conditionalities and best practice. It also discusses the role of the private sector, the Equator Principle banks and the International Finance Corporation (IFC) and the increasing role played by China both domestically and internationally.

The World Commission on Dams remains a relevant milestone

The work of the World Commission on Dams (The WCD) culminated in its report to the international community, *Dams and Development: A new framework for decision-making* (The WCD, 2000). This document comprehensively framed the development opportunities and risks of large hydropower and dams in today's context. The WCD still provides an essential reference in the world of dams and in the 13 years since the report was launched, many national, regional or donor-led international bodies have sought to respond to the challenges the WCD outlined, in the process identifying and codifying more good practice approaches.

The WCD recommendations are widely acknowledged as challenging to apply systematically to individual dams at the project level. The commission itself felt that every dam was embedded in different geographies and cultures, with different local needs and aspirations. As a consequence, there is no 'one size fits all' standard for the design and implementation of large dams. Many WCD recommendations refer to the national framework of planning and regulatory provisions as well as river basin planning and management processes (both at national and transboundary levels), and the translation of governments' international commitments into their own decision framework.

The WCD explicitly recognised that its recommendations had to be adapted to local context. To this end it stated, '[t]he (WCD) report is not intended as a blueprint. We recommend that it be used as the starting point for discussions, debates, internal reviews and reassessments of what may be established procedures and for an assessment of how these can evolve to address a changed reality'. Essentially, different parties could climb the ladder towards meeting the WCD aspirational recommendations at different rates, adapting as they went.

Some actors, including many World Bank staff, industry observers and governments, felt the WCD not only placed the bar too high, but it also failed to propose operational standards that could be readily applied and measured. Other actors applauded the framework or indeed saw the WCD as a blueprint. The EU and the OECD immediately started to refer to or recommend the framework partially or in its entirety, and have since worked towards using the WCD as a framework to assess and improve national standards. Other international bodies, such as multilateral donors, have incorporated some, but not all, of the ideas and concepts into their environmental and social safeguard policies and best practice.

Sustainability assessment as an essential part of a new framework

The International Hydropower Association (IHA) joined with donors, governments and non-governmental organisations (NGOs) to adapt and expand the WCD guidance into a practical, collaborative tool – the Hydropower Sustainability Assessment Protocol (HSAP, 2010a). In it, they sought to translate many of the WCD recommendations into operational form, and at the same time incorporated other sustainability concepts that have also been developing over the last ten years, such as the focus on governance issues.

The HSAP emerged as a uniquely significant response to the WCD, in the sense that it enables sustainability aspects of large dam planning, design and management to be measured and scored through an independent and certified assessment process. Equally importantly, it seeks to measure good practice in hydropower decision making in a collaborative process, engaging with the government, civil society and private sector actors involved, and with local communities.

There will doubtless be different perceptions of the degree to which fully independent assessments can be achieved. For many observers, a combination of some HSAP assessors being drawn from ex-IHA staff and the IHA continuing to provide a promotion and secretariat function for the protocol may not fully allay their concerns. The acceptability of the protocol process to all local stakeholders will ultimately depend on the degree of real and perceived independence it brings.

This review concludes that, taking all factors into account, the HSAP offers an operational tool to assess *individual* project performance on a range of scored indicators. While the protocol does not cover identical ground to the WCD, which was more about policy and direction setting, it encompasses key elements of the WCD relevant to an individual dam project through the project cycle, with the distinct advantage of making them measurable. In many respects the HSAP currently offers the best available 'measuring stick' for the respect for the WCD provisions in individual projects as noted, for example, in EU Directives.

The HSAP process is of particular interest as it codifies a scoring system to measure good practice and benchmark the project against best practice around a broad range of themes. Repeated assessments over time can potentially show progress towards a Level 5 score on the 23 indicators of best practice. There is an emerging body of experience with the HSAP. Certified assessors have undertaken nine assessments (as of November 2013), seven of which have been published on the HSAP website. The OECD has recognised the HSAP as a reference alongside the WCD.

Comparing the WCD to other safeguards

The multilateral banks are in the process of reviewing their operational standards for the environmental and social performance of large hydropower, while the IFC did so in 2012. The main differences between the WCD and these standards are:

1. **The WCD envisaged the translation and application of its guidance at both strategic (basin and sector) and project levels**

   No single actor can implement the whole of the WCD without referring to other sectors (e.g. water, energy and environment) or consulting at the river basin scale. This makes it hard to measure an individual dam against WCD recommendations in part because that requires measuring policies, while most other safeguards are designed for project-level implementation.

2. **None of the other safeguards approaches allows an easy, direct comparison with the WCD**

   The HSAP offers the closest approach to practically measuring respect for the intent of the WCD.

3. **Interpretation of 'stakeholder participation'**

   The WCD promoted negotiated outcomes and signed binding agreements. Other standards variously speak of 'agreements' or 'engagement' of interested

and affected stakeholders. The challenge of measuring 'effective participation' remains, however the HSAP probably comes the closest to the WCD on this issue, at its highest level of scoring (Level 5), followed by the relevant standards of IFC and the World Bank.

4. **Specific references to human rights**
   The WCD explicitly promotes a rights- and risks-based analysis to inform negotiation at all levels. Not all political systems actively involved in hydropower planning and management recognise this foundation. There has been little appetite for explicitly assessing rights and risks to all stakeholders as the preferred framework for stakeholder identification for mitigation planning and benefit sharing for dam projects.

5. **Treatment of biodiversity and downstream impacts**
   The WCD called for specific measures for endangered and threatened biodiversity. Most standards adopted by governments and international bodies talk of avoiding, mitigating and compensating for biodiversity impacts but offer little guidance as to how far that should go.

6. **Comprehensive option assessments to inform any consideration of new dams**
   The WCD stresses the fundamental value of comprehensive options assessments to help screen out bad projects early in the strategic planning processes, well before commercial and/or political interests combine to favour a particular project or prevent the full consideration of viable non-dam options. Few standards or safeguards seriously tackle this 'level playing field' issue.

7. **Independent review**
   The WCD stressed the importance of external review and feedback on outcomes to inform continued development of good practice. Holistic evaluations of large dams after they are built are still rare despite the scale of the investments made in relation to the national economies.

8. **Compliance plans**
   The WCD noted that many of the commitments made in plans are not fully complied with and recommended more rigorous monitoring and evaluation. Only the IFC performance standards specifically envisage continuous monitoring throughout the project cycle to build capacity for compliance; other systems focus primarily on a decision point for financing, mainly during project design.

This review concludes that despite certain inconsistencies between details, there is an emerging convergence as to what sustainable hydropower development and management looks like, and the various elements of best practice in achieving it. Some fault lines remain. It remains to be seen if the internal reviews now being carried out by individual multilateral financial institutions of their safeguards fully consolidate that movement, but the direction of travel since 2000, as judged by the IFC standards and the Hydropower Sustainability Assessment protocol, is generally towards the WCD aspiration rather than away from it.

Safeguards linked to financing streams – is the bar set too high?

Safeguard frameworks are a combination of mandatory compliance with national legislation and any additional conditionalities the government and other parties accept that are linked to different external funding sources for dam projects.

This review estimates that only around 10-15 per cent of new hydropower dams around the world are covered by dam-specific international environmental and social safeguard processes (e.g. MFI, EU Linking Directive, CDM, OECD/ECA policies). Equator Principle finance may apply to rather more, however the majority of dams today are constructed solely under provisions of national legislation. Apart from being the single largest user of hydropower domestically, China has recently become the single largest financer of hydropower in developing countries and has no explicit safeguard policy. Some reports suggest Chinese finance now supports half of new hydropower dams constructed globally.

Financing for hydropower in the carbon markets through the EU Linking Directive explicitly links carbon credits for large hydropower projects to respect for the WCD criteria and guidelines. The EU voluntary template is a self-assessment tool for project developers that sets out how EU authorities will asses the required 'respect' for the WCD prior to allocating carbon credits from the EU Emissions Trading Scheme. This is a voluntary benchmark for EU member states.

This review concludes that the assessment process under the EU Directive is not fully independent of the project developer, lacks analytic rigour and falls short of guaranteeing attainment of the WCD criteria and guidelines in the way intended. Although this is partly due to the WCD being challenging to measure for individual dams, it is also due to the manner in which the EU member states have proposed to assess and interpret 'respect' for the WCD. Adhering to the EU template may constitute 'respect' for the WCD as defined by the EU, but to fully implement the WCD would require a much more comprehensive approach. The EU approach also lacks any formal monitoring and evaluation to assess whether the outcomes on the ground are indeed as the WCD intended.

Respect for the WCD process under the EU Linking Directive is therefore unlikely to constitute a significant barrier to accessing EU carbon credits. This is evidenced by the large number of projects in China accessing EU and Clean Development Mechanism carbon financing, considering that China did not embrace the WCD recommendations. Unfortunately the data on how many requests are rejected due to non compliance, and why, are not publicly available. It is also noted that only emission reduction projects in less developed countries will be eligible for credits in the next phase of the EU Emissions Trading Scheme. China and some other countries are in the process of considering their own carbon trading systems.

Should small and large hydro be treated differently?

When assessing the social and environmental risks of hydropower projects there has been an assumption that larger projects may have greater impact. This review concludes that there is little evidence for higher impacts being directly or solely linked to installed capacity (e.g. greater or less than the 20 megawatts of the EU Linking Directive) because the degree and significance of impacts are highly site specific.

As dam reservoirs can emit greenhouse gases, the Clean Development Mechanism process has screened out support for particular types of dam most likely to be prone to high emissions. Broadly, the larger the reservoir area per unit of electricity generated, the greater the possibility that reservoir emissions may exceed the thermal generation offset through hydroelectricity displacing conventional coal, gas or oil burning. Dams with low installed capacity but large reservoir areas are therefore most at risk. This policy has led to nearly three quarters of dams supported by the mechanism being run-of-river hydropower projects, with no or very small reservoirs.

Run-of-river schemes can have lower social and environmental impacts than storage reservoirs, but this depends on the design, operation and river basin setting as well as specific location factors, such as the degree of obstruction of instream biodiversity movements and, where there are diversions, the possible drying of the area immediately downstream. Multiple small hydropower projects may be packaged as a single project, making measures of cumulative basin impacts appropriate. In the absence of WCD-style national or basin-level screening processes, a precautionary approach using a size threshold, such as the 20 megawatts adopted by the EU, will serve to ensure possibly damaging projects undergo more rigorous assessments. Conversely, dams with larger reservoirs which allow seasonal or multi-year storage have a greater scope in climate adaptation from the electricity generation perspective. Storage hydropower provides base-load support and therefore complements intermittent renewable generation, such as wind, solar and wave, increasing the proportion of these low-carbon technologies that can be included in a power system.

Improving the effectiveness of the policy framework and delivering sustainable outcomes

As national legislation is obligatory, it acts as the ‘minimum standard’, capturing all projects, at least on paper, irrespective of project funding conditionalities. Assessment of exactly how many dams currently under construction worldwide are captured by an additional safeguard policy is difficult, but the majority of dams are probably built subject only to ‘minimum’ national standards. These standards will often apply to all types of development project, not just dams, and are unlikely to deal adequately with the specific and often severe nature of dam impacts. Any strategy that seeks to promote improved social and environmental outcomes from dams should therefore consider how to bring best practice into mainstream regional, basin or national legislation along with the capacity to implement it.

Many challenges remain in implementation capacity, independent review of projects, and monitoring and evaluation of social and environmental outcomes in the developing country context. Major emphasis is still placed on the decision point when a donor/fund/bank accepts to finance a project, with weaker follow-up thereafter. International good practice is, however, gradually being incorporated into national legislation. Local experience of applying voluntary and conditionality standards is growing, due in part to the efforts of civil society networks and local political pressures from dam-affected communities.

Regional approaches such as the Niger Basin Authority or Mekong River Commission are increasingly harmonising international good practice on dams into acceptable and often obligatory multi-country guidance. Given the context-specific nature of dam-related impacts, these remain essential to complement national legislation requirements that are applicable to all infrastructure projects.

Developing countries vary in their institutional capacity. For instance, only 60 per cent of all projects supported by the World Bank globally rated satisfactory or better at meeting the bank's safeguards, and only 40 per cent in Africa. The WCD requires the capacity to: (i) undertake the environmental and social assessment the WCD calls for; (ii) provide and fund appropriate monitoring and compliance systems; and (iii) manage processes to balance stakeholder views on interpretation of conformity to the WCD and other compliance requirements. This underlines the need to encourage countries not only to adopt dam-related safeguards, but also to build the capacity to implement them in an open and transparent manner.

It is ten years since the EU Linking Directive was put in place, in 2004. Some form of independent evaluation or review would help to understand and improve its operation over time. The HSAP could prove a useful tool in this regard as it promotes constant self improvement. In the absence of such a review, critical NGOs may continue to point to deficiencies in individual projects without being able clearly to distinguish the anecdotal from the systemic.

As the WCD concluded, '… the end of any dam project must be the sustainable improvement of human welfare. This means a significant advance of human development on a basis that is economically viable, socially equitable, and environmentally sustainable.' Meeting this challenge clearly requires effective safeguard regimes and especially the capacity and resources to engage stakeholders in mechanisms for continuous improvement and to secure and maintain public acceptance.

Recommendations

The WCD was not prescriptive, or cast in stone. It argued for negotiated outcomes appropriate to each national and local context. Moreover, safeguards are inherently dynamic tools. To be effective, they need to measure and reflect stakeholder perceptions of risk and uncertainty, and take into account the best available information and analysis, as well as societal values, as they all evolve over time. While this review was undertaken primarily as a scoping exercise, we make six recommendations to all stakeholders to help assess the coherence of different safeguards, and ultimately narrow the gap between the WCD aspiration and current practice. They should facilitate the continuous improvement of dam safeguards internationally.

1. Agencies seeking to measure the degree of compliance of individual projects with the WCD principles should increasingly adopt the HSAP as the most practical currently available evaluation tool, subject to the assessment teams reassuring third parties of the independence of the assessors.
2. Agencies should support more HSAP assessments in different contexts and geographies in order to boost the number of datasets available and gain experience, ensuring the feedback is incorporated into the protocol provisions, methods and approaches of the certified assessors.
3. Implement processes to develop regional or basin-level standards on environmental and social impacts that capture all hydropower projects in a harmonised manner, irrespective of the funding stream.
4. Formally review the effectiveness of the current EU Linking Directive's voluntary template and process. Monitor the outcomes of a subset of projects funded under the Directive's carbon credit programme to establish whether respect for the WCD criteria and guidelines has indeed generated more sustainable outcomes and assess how this experience can inform future policy orientations.
5. Seek legal clarification of a donor government's precise commitments under EU and OECD obligations to 'respect' or 'refer to' various types of standards or guidelines and harmonising such interpretation between government departments.
6. Although the EU has adopted 20 megawatts as the threshold for hydropower schemes requiring the application of environmental and social safeguards, there is evidence to indicate adverse impacts from schemes below 20 megawatts. Project proponents and financiers should consider smaller projects in context and effectively assess their cumulative social and environmental implications.

These recommendations are addressed at all stakeholders with an interest in achieving sustainable social and environmental outcomes from large dams. More specifically, the recommendations are offered for government actors and stakeholders who are currently active in EU-supported processes on dam safeguards and how they interconnect with water and energy resource, environment and climate change policies and programmes. This includes key stakeholder interests from civil society, industry, finance and the international development communities.

Introduction

1.1 International context

During the 1990s, a number of high-profile dam projects around the world became mired in controversy over their social and environmental impact and their effectiveness as a development tool. As a consequence, multilateral funding for large projects declined, but the last five years have seen a significant resurgence of hydropower in some parts of the world as a response to both climate change and rising energy prices, as well as providing water storage to mitigate the impact of climate change on rainfall, floods and water supplies.

The renewed focus on large dams raises the issue of balancing the trade-offs between the global benefits from carbon mitigation and the local impact on communities, ecosystems and sustainable development. Is the bar for environmental and social standards currently set at a reasonable level or is it favouring particular development pathways and distorting others?

The framework developed by the World Commission on Dams (WCD, 2000) was a key milestone in the process of managing these trade-offs. It still provides an essential reference in the world of dams, even though in the 13 years since its publication, many other sectoral, national, regional and donor-led safeguarding processes have been developed, some of which are described in this report.

In 1998 the World Bank and the World Conservation Union brokered the establishment of the World Commission on Dams (WCD). It was tasked with reviewing the development effectiveness of large dams[1] and proposing a set of principles and guidelines that could provide a new framework for decision making. This would address the increasingly polarised debate between vociferous non-governmental organisations (NGOs), who pointed out the failings of large dams, and industry stakeholders and governments who saw large dams as an essential development tool. The publication of the commission's report in 2000 prompted a mixed reaction. NGOs broadly welcomed the report and multilateral banks accepted the relevance of the WCD's seven strategic priorities (SPs), but expressed concern about the prescriptive nature of the 26 accompanying criteria and guidelines. Industry actors regarded it as difficult to apply and likely to make projects longer and more expensive to develop and deliver.

In the preface to the report, the chairman of the WCD, Kader Asmal, wrote that the guidelines are not a blueprint, but need to be shared, discussed and modified according to the local context in which dams are being developed. Some stakeholders, such as the Water Resources Coordination Centre of the Economic

1. The International Commission on Large Dams (ICOLD) defines a large dam as being over 15 metres high (ICOLD, 2013). The definition also includes dams between 5-15m high with a reservoir exceeding 3 million m^3. There are more than 52,000 large dams worldwide.

Community of West African States (ECOWAS), have since followed this pathway. Over the years since the WCD report was published, the operational standards adopted by different stakeholders within the world of large dams have multiplied. In addition to national standards, dam projects may be required to meet additional safeguard requirements linked to particular donors (such as multilateral banks) or to a funding stream (such as carbon credits).

Others have developed voluntary tools to advance best practice around individual dams. For example, since 2004 the International Hydropower Association (IHA) has led the development of a Hydropower Sustainability Assessment Protocol (HSAP) with a view to establishing an industry code of practice. This protocol has been updated following the constitution of a multi-stakeholder working group involving representatives from the hydropower industry, governments (including China), donors and NGOs. The protocol was finalised in 2010 (HSAP, 2010a), and built on the International Hydropower Sustainability Protocol of 2006. The protocol can be applied to hydropower dams of any size and stage of development, from planning through to construction, operation and retrofit.

Shortly after publication of the WCD report, the European Parliament adopted one of the few measures worldwide that makes respect for WCD criteria and guidelines a legally binding requirement. The EU Linking Directive[2] (2004) explicitly linked access to EU carbon credits for large (greater than 20 megawatt) hydropower projects to 'respect' for the WCD guidelines during project development. In 2012, the OECD Council also recommended its members, in the absence of any relevant industry-sector environmental, health and safety (EHS) guidelines, to 'refer to relevant international sources of guidance such as, for example, where appropriate, the Hydropower Sustainability Assessment Protocol (HSAP) and the Core Values and Strategic Priorities of the World Commission on Dams (WCD) Report for hydro-power projects' (OECD, 2012) when reviewing export credit deals.[3] OECD recommendations carry less legal weight than EU directives.

Over the last five years, the multilateral banks have re-engaged more fully with support for large hydropower projects as a tool for mitigating climate change (to offset emissions from power stations burning fossil fuels)[4] and to consider the impact of large reservoirs on climate adaptation.[5] In the last decade China has dramatically increased its share of funding for dam projects globally, and private investors have shown increasing interest in investing in private projects. This is due to changes in power-sector investment criteria driven by price volatility in international energy markets (for oil, coal and other conventional fossil-fuel generation), and to a lesser extent the availability of carbon credits for hydropower.

2. Directive 2004/101/EC establishes a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms (European Parliament, 2004).
3. See extract in Annex 7.
4. See for example Schneider (2013).
5. Where there is the potential to modify the operation of existing large dams with significant reservoirs to mitigate flood and drought conditions amplified by climate change, or to reduce already adverse impacts that existing dams may have in river basins now under water stress, which climate change may exacerbate.

Some private banks have signed up to the Equator Principles and will only provide loans to projects that conform to their environmental and social policies. Equator Principle Financial Institutions (EPFIs) use these principles during their due diligence processes to decide whether to lend to new or retrofit hydropower projects.

Since the WCD report was published in 2000, the concept of sustainability has also widened. It now embraces the concept of 'governance', including transparency, integrity and accountability. The HSAP in particular highlighted governance as one of its topics and covers it in more depth than the WCD. This illustrates the way in which the WCD framework may gradually be built on and superseded as practice evolves.

These developments have generated an increasingly complex landscape of regulatory and voluntary standards. IIED has undertaken this broad scoping review as a first step towards clarifying the current context. It examines the relative coherence of the different safeguards, approaches and standards now applied to hydropower projects to assess their intentions and their effectiveness in delivering social and environmental safeguards. It focuses particularly on hydropower projects, and their implications for climate change, while acknowledging that dams are also built for water supply, irrigation and/or flood control purposes.

1.2 Structure and purpose of the report

This report describes the current global landscape of large dam construction and some of the ongoing challenges linked to balancing sustainable development at the global level (e.g. climate change mitigation), with that at the local level (particularly social and environmental responsibility), notably in applying different safeguard policies in different funding streams.

The review focuses especially on the World Commission on Dams due to its citation in the EU Linking Directive that commits the EU governments to a particular course of action when considering the allocation of EU carbon credits. In this review, we examine the UK government's application of the EU Linking Directive as an example. The review then asks whether there are potential inconsistencies with social and environmental safeguards linked to other funding streams directly or indirectly supported by those same governments. It also touches on a range of other issues related to hydropower and climate mitigation and adaptation. It considers run-of-river schemes – hydropower projects which do not rely on a large reservoir to generate power – and the justification for treating 'small' and 'large' hydropower schemes differently and whether the existing boundary between them (20 megawatts) is justified.

Chapter 2 reviews the current funding and policy landscape for dam construction and the safeguards that apply to different dams under different circumstances. As many safeguards are conditionally linked to funding streams, it maps the actors and sources of funds in order to understand which safeguards are commonly applied

Fishing provides a major source of employment around Sélingué hydroelectric dam, Mali

Photo: Alioune Ba / Global Water Initiative

and on what scale. It also describes current trends in international dam-related policy and official development assistance (ODA) support along with consideration of the climate change dimension.

Chapter 3 reviews the detailed provisions of the WCD, while Chapter 4 describes the Hydropower Sustainability Assessment Protocol (HSAP) and compares its provisions to the WCD approach. Chapter 5 presents multilateral donor safeguards while Chapter 6 describes opportunities for hydropower within a low-carbon strategy, reviewing the appropriateness of run-of-river schemes as well as the various thresholds for financing packages. Chapter 7 reviews the 'respect' for WCD criteria and guidelines for projects receiving carbon credits under the EU Linking Directive and considers how far the WCD provisions are respected overall and how safeguards could be made more effective.

Chapter 8 draws general conclusions, reflecting on areas of agreement and disagreement with respect to global and local sustainability objectives and the applicability of safeguards in different funding contexts. It also offers recommendations for initial steps to assess the coherence of safeguards with a view to closing the gap between the WCD's aspiration and current practice. The annexes present further details on the main issues addressed in order to shorten the length of the main report.

1.3 Dams of different kinds, financed in different ways

Dams come in many shapes and sizes and have many different purposes. Some 52,000 large dams have been built over the last century and more. These have been funded by governments, private banks, donor agencies and private investors and built under a hundred or more different national and international regulatory systems that have evolved over the years. Dams may be multipurpose projects that combine several functions. Larger-scale dams offer the potential for hydropower, irrigation, water supply, navigation and flood management projects. There are many different types of hydropower at different scales, ranging from isolated household supplies, to small, mini and micro-scale hydropower for decentralised grids, to large grid-feeding projects serving national or regional power markets.

While the main body of national and international standards for environmental and social performance are broadly applicable to all types of dams, hydropower dams present unique considerations, not only in terms of financing sources, but also in terms of low-carbon energy strategies. There are also much better data sets for planned hydropower plants due to intense private and public-sector activity in this market. Data for planned flood control or irrigation dams are much harder to find and collate and these tend to be purely public-sector projects.

Through its focus on hydropower, this review necessarily touches on the relationship between hydropower and other intermittent renewable energy sources for grid-scale power. Large hydropower dams may serve to complement solar and wind power

sources as part of a low-carbon energy supply mix. Run-of-river hydropower projects may fit into low-carbon energy systems in developing countries.

Large dams are expensive infrastructure projects that are built within a complex legal and financial regulatory landscape. Social and environmental measures can be expensive, in some cases reaching up to 40 per cent of project cost or more.[6] For private investors significant costs in these areas affect the profitability (and therefore viability) of the project. While some developers may have internal corporate social responsibility guidance that provides a framework for addressing these issues, the majority decide their environmental and social measures based on the legal requirements stemming from national legislation, usually through environmental assessments. If international financing is involved, however, then donors or private banks may impose additional conditions.

Hydropower has specific impacts that are significantly different from other infrastructure projects such as roads or airports and often have far-reaching effects on resources. Water is used by many communities, both upstream and downstream, and river valleys have traditionally been the foci of settlement and agricultural activity. Large dams have impacts on ecosystems, communities and other water users (cities, agriculture, fisheries) many miles downstream and the range of additional safeguards, processes and policies addressed in this review have been developed specifically to address them.

6. For example the planned Fomi Dam in Guinea. For relevant background see Wetlands International (undated) and Thomson Reuters Foundation (2013).

Large hydropower: the planning and funding landscape

This chapter categorises the various kinds of social and environmental standards now in use world-wide for large hydropower schemes, assesses the proportion of dams supported by various financing sources, and comments on the degree to which social and environmental safeguards are respected, based on the funding sources and setting.

2.1 Typology of environmental/social criteria and standards

The Venn diagram in Figure 1 conceptually represents the three broad categories of environmental and social standards applicable to hydropower and other large dam projects today. National standards will be unique to the planning, legal and regulatory framework of each country. These are legally binding, regardless of whether a hydropower project is developed and operated by public or private-sector entities, or how it is financed (whether via private or public financing, domestic or international sources, or a mix).

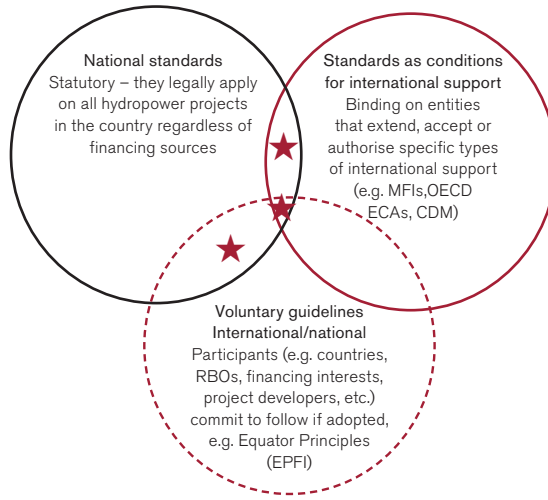
Above the national standards lies an array of mandatory standards that have been adopted by international and regional lending agencies. These apply to all parties who extend, approve or access specific types of international financing support for hydropower (for example, commercial or concessionary finance, export credit agency credit guarantees, or carbon financing). They are additional to national standards and may go further or set the bar higher than national standards do. The third category encompasses voluntary guidelines formulated and advocated by different stakeholders, and applying at any level from the river basin, through to national or international levels. These may be adopted by governments on a voluntary basis or by river basin entities, power utilities, financers, and hydropower project proponents and operators who commit to respect them.

One question is what proportion of hydropower projects fall into each category, particularly the overlaps indicated by a star in Figure 1.[7] A second question is what is driving the evolution of standards in each category. For example, voluntary guidelines may be seen in a positive light, as driving progressive improvements in national practices over time. Or they may be perceived as pushing project developers increasingly towards sources of finance that do not legally require social and environmental safeguards beyond the national minimum requirements.[8]

This review concentrates mainly on international guidelines and standards. However, their effectiveness and implementation must also be considered in conjunction with the institutional capacity to implement them on top of existing national standards.

7. For some hydropower projects all categories of standards apply. For example, a project financed by an Equator Principle Financing Institution (EPFI) that also seeks carbon finance support may need to meet all three standards in Figure 1. An overseas hydropower project financed purely by, say, China's EXIM Bank may only be required to meet standards in national legislation where the dam is located.
8. What is referred to in critiques of environmental and social standards as a 'race to the bottom'.

Figure 1. Standards applicable to financing hydropower and dam projects



This includes the capacity of the public sector, private sector and civil society actors involved and their respective roles and interests. Table 1 illustrates standards that apply within this simplified framework. Note that the WCD and HSAP have a hybrid position here as in some places they are cited in legally binding legislation or official recommendations (for example the EU Linking Directive, see Section 7.2) but elsewhere they remain voluntary.

To access international financing for hydropower, project developers have to comply with an evolving set of standards which may differ from funding stream to funding stream. Typically, access to international funds means meeting standards that are additional to, and higher than national standards contained in project agreements referred to in Table 1. While this may lead some countries and developers to avoid external funding with 'high transaction costs', or 'high' standards,[9] it may be argued that the pressure exerted by such standards do in practice oblige countries and developers to improve their understanding, capacity and procedures over time. Moreover, this awareness can translate into improved national regulatory systems, once the standards have been adopted on some projects in the country. As confidence in their use grows, they may become common practice and part of the mainstream. Multilateral financial institutions (MFIs) are often early adopters of such approaches, making good practice mandatory before they extend or receive hydropower-related support.[10] The situation is therefore dynamic, where 'good faith' approaches help to promote continuous improvement through regular monitoring, benchmarking of progress and updating.,

9. For example, the World Bank is often cited as a 'lender of last resort' due to its higher safeguard standards.
10. There is a body of good practice developed by international financial institutions (IFIs), intergovernmental bodies and international NGOs, which are voluntary in nature but considered binding if adopted by national governments and financial institutions. Guidelines like the WCD and the HSAP Protocol draw together many elements of accepted good practice.

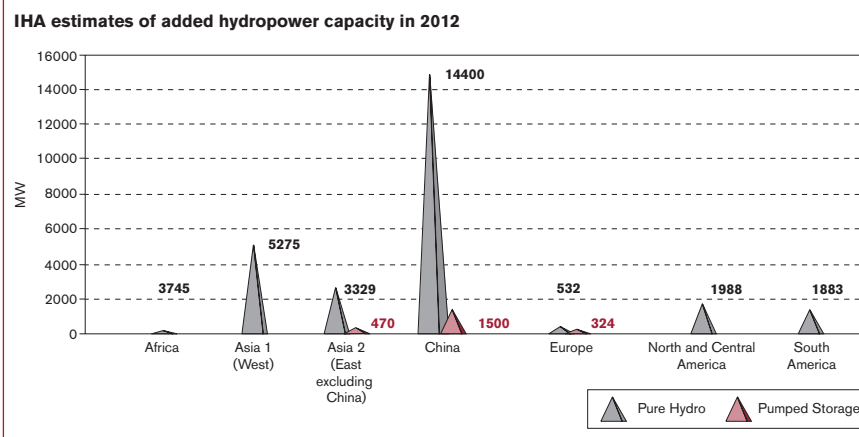
Table 1. Typology of voluntary and mandatory standards and guidelines

Standards as conditions for international funding support for hydropower projects	**Voluntary standards and guidelines** regional and international commitment to follow when adopted by parties
■ World Bank Safeguard Policies (E&S and Dam Safety) ■ OECD's Export Credit Group Renewable Energy Agreement Guidelines (OECD, 2005) ■ OECD EIA guidelines ■ Other IFI policies (ADB, AfDB, IADB, etc.) ■ EU Linking Directive (European Parliament, 2004) ■ Bilateral and regional carbon funds.	■ Equator Principles ■ IEA Hydropower Agreement ■ Regional agreements accepted by individual governments e.g. Preliminary Design Guidance in the Mekong (MRC, 2009) ■ ICOLD and IEEA technical guidelines ■ Low-impact hydro standards. ■ WCD guidelines with a small 'g'.
Both mandatory (when cited in legislation) and voluntary: ▪ WCD (Strategic Priorities and Policy Principles) ▪ Hydropower Sustainability Assessment Protocol (HSAP)	
Binding on all participants that seek or provide financing for projects. Generally monitored and independently verified.	Binding on parties who 'signed up' when adopted in national systems, or by regional/ international bodies. Not necessarily independently verified.
Signed international/regional conventions and agreements adopted in national laws e.g. the Mekong 1995 Agreement and supporting Procedures (MRC, 1995), the Ramsar Convention (Ramsar, 1971), and the EU Water Framework Directive (European Union, 2000).	
National or basin-wide environmental and social regulations and standards	
■ Sector, basin, and regional strategic environmental assessments (SEAs) ■ Project-specific environmental/social requirements and guidelines ■ Compensation and resettlement standards ■ Environmental flow assessments (EFAs) and policy provisions – where present ■ Benefit sharing and payment for ecosystem services (PES) – when adopted into law ■ Environmental and social conditions in project agreements (e.g. project development agreements (PDAs), power purchase agreements (PPAs), Emission Reduction Purchase Agreements (ERPAs), and project concession agreements (CAs)	
Statutory requirement on all hydropower/large dam projects in the country regardless of the source of financing or the proportion of support from any financing source.	

2.2 Past and recent hydropower and dam trends

Figure 2 shows the new hydropower capacity (in megawatts) added in 2012 by region of the world. Although hydropower investment is 'lumpy' year-to-year, it shows that hydropower investment in Asia accounted for more than 73 per cent of the 31,162 megawatts of global capacity added in 2012.[11] Any conditionalities linked to funding would have been established prior to construction, and hydropower projects may take four or more years to build, and often several years to design and finance. Thus projects commissioned in 2012-13 will probably have been designed under guidance from around 2006/2007.

Figure 2. Global hydropower capacity additions by region in 2012



Source: IHA (2013).

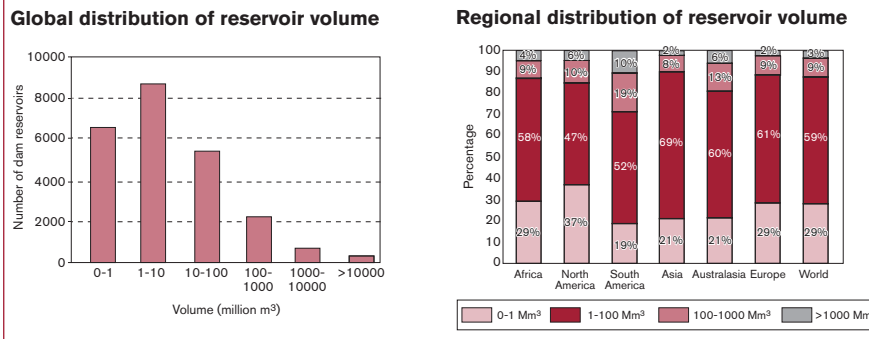
The WCD Report (2000) served as a useful benchmark for the number and type of large dams, globally and regionally, over a decade ago. Looking at the type of dams relevant to this review, the WCD statistical data indicates that in 2000:

- Hydropower dams (single and multipurpose) comprised about 23 per cent of the 45,000 large dams. Thus, nearly a quarter of existing dams had the potential to offset thermal greenhouse gas (GHG) emissions in domestic and regional power markets.
- The largest category of large dams by function was irrigation (about 50 per cent), followed by hydropower (23 per cent), and water supply (12 per cent).
- Run-of-river schemes represented less than a third of dams globally, and were mainly for hydropower (between19 per cent and 39 per cent according to the region).
- About 13 per cent of large dams globally were listed as primarily for flood management.

11. Excludes 2314 megawatts of new pumped storage commissioned in 2012, again mostly in Asia, but also in Europe.

Figure 3 gives a general sense of how many dams may have been run-of-river (ROR) schemes, on the assumption that these schemes generally have reservoirs with a volume smaller than 1.0 million cubic metres (excluding the limited number of ROR projects with large reservoirs; see discussion in Section 6.3).[12] Most smaller reservoirs are likely to be for hydropower because irrigation and water supply schemes tend to require substantial water storage.

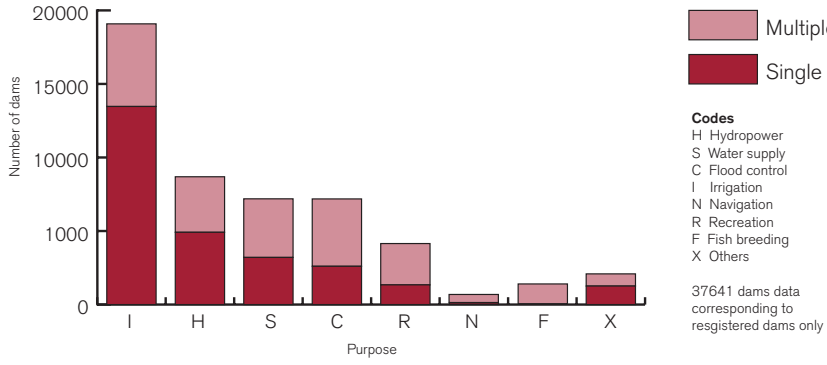
Figure 3. Global distribution of dam reservoir volume, 2000



Source: ICOLD (1998) cited in WCD (2000) (Statistical Annex).

Figure 4 shows the 2013 data on the types of dams from the International Commission on Large Dams (ICOLD) Registry (ICOLD, 2013). Of the 37,641 dams registered by 2012, the proportion of hydropower dams has remained stable at about 23 per cent over the last decade. There are several hundreds of thousands of hydropower schemes worldwide, however, which are under 15 metres high and so not included in the ICOLD Registry.

Figure 4. Global breakdown of large dams by purpose



Source: ICOLD (2013). General synthesis.

12. For example, in Africa less than 29 per cent of dams are ROR (light blue in the right-hand panel of Figure 3); in North America ROR dams make up 37 per cent of all dams.

A resurgence in large hydropower investment

There have been many forecasts for installed hydropower capacity and related trends by country and region. Projections by the International Energy Agency (IEA), the World Wide Fund for Nature (WWF) and the World Energy Council[13] all paint a similar picture of more hydropower construction in some countries, and the refurbishment and upgrading of hydropower in countries with existing hydropower, as dams age.

Four examples illustrate the overall trends:

- The World Bank Group's 2009 report, *Directions in Hydropower: Scaling up for development*, suggests that, '… after a period of stagnation, the story of hydropower infrastructure is changing' (World Bank Group, 2009; see also Box 1). The World Bank called for an acceleration of hydropower development globally, including in Africa and Central Asia.
- Hydropower is accelerating in the Mekong Region, where over 30 large projects are now under construction. According to the Mekong River Commission (MRC), the most probable future scenario sees 76 large hydropower dams operating in the Lower Mekong River System by 2030, compared to 14 operational in 2000 (MRC, 2011b).[14]
- Brazil's national energy plan to 2030, as proposed by the research and planning arm of the Ministry of Mines and Energy, foresees a major expansion of hydropower. This is based on an estimated 164 gigawatts of unrealised hydropower potential in the Amazon and the ministry's view that a major expansion is required to meet the forecast annual increases in electricity consumption of 4.1 per cent, corresponding to 4.1 per cent growth in gross domestic product (GDP) per year (MME, 2007).
- China's new 'green energy' policy means hydropower is projected to play a greater role in meeting ambitious 2020 renewable energy goals, and equally in China's global financing of dams (for more detail see Dembicki, 2012).

The World Bank Group (WBG)[15] suggests several factors are driving the resurgence in hydropower construction, which link to climate change mitigation and adaptation (see Box 1). Its report, *Directions in Hydropower* (World Bank, 2009), argues that 'scaling up' hydropower is not limited by physical or engineering potential (although it may be limited by environmental or social considerations). It found 91 per cent of the economically feasible hydropower potential worldwide was in developing countries,

13. See World Energy Outlook (IEA 2013) and also Renewables 2013: Global status report (REN21, 2013). As a historic baseline, hydropower represented over 50 per cent of national electricity supply in 63 countries in 2000. Over 150 countries have hydropower and it represents more than 90 per cent of the total national electricity supply in 24 countries and over 50 per cent in 63 countries (WCD, 2000). While hydropower capacity more than doubled from 6109 million tonnes of oil equivalent (MTOE) in 1973 to 13,311 MTOE in 2011, the percentage of global energy demand (all sectors and fuel types) met by hydropower only rose from 1.8 per cent to 2.3 per cent (IEA, 2013; IEA Country Statistics, available at http://www.iea.org/statistics/statisticssearch/).

14. Controversial lower Mekong mainstream dams are not included.

15. The World Bank Group encompasses the activities of five institutions: the International Development Agency (IDA), the International Bank for Reconstruction and Development (IBRD), the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA) and the International Centre for Settlement of Investment Disputes (ICSID).

Box 1. The World Bank and hydropower

'After a period of stagnation, the character of hydropower infrastructure is changing. Emerging global dynamics are recasting the role and value of hydropower in development, recognizing its potential contribution to a complex web of energy security, water security and regional development and integration. As a renewable energy resource, hydropower's dual role in climate change adaptation and mitigation is critically important. As new dimensions of value evolve, so does progress in managing the risks and negative impacts associated with development projects, particularly those related to ecosystem services and social inclusion. Increasingly, the international community is embracing sustainable development as the paradigm for hydropower investments.'

Source: World Bank (2009).

one quarter in China.[16] The report emphasises the role of the WBG lies in leveraging other sources of finance, broadening the basic foundations of the energy sector to scale up hydropower, building national regulatory capacity, and improving the environmental and social management aspects of hydropower.

Underpinning this resurgent interest in hydropower are several trends that have implications for environmental and social standards on both new and existing hydropower, as well as the consideration of low-carbon strategies and carbon financing.

This review highlights five emerging themes:

Theme 1. **The implications of power sector reforms for dam safeguards.** The nature and direction of regulatory reform in the power sector in most countries shape the selection of electricity demand-supply options today. These reforms mean the way in which environmental and social standards are applied to hydropower and the monitoring of their effectiveness are also changing.

Theme 2. **Asia's emergence as a global leader in financing dams.** The pace of dam construction in China and the region, coupled with China's emergence as a global centre for power-technology manufacturing under licence and technology-transfer arrangements, and financer of hydropower in other countries, is key. To a lesser extent this is also happening in other BRICS (Brazil, Russia, India, China, South Africa) countries.[17]

Theme 3. **The globalisation and diversification of dam financing.** Finance for water and power infrastructure is progressively shifting to the private sector under regulatory reforms, which vary from region to region and serve to encourage the use of new finance instruments and more diversified sources of finance and few common standards.

16. The potential 1330 gigawatts of capacity is seen as a conservative estimate of unexploited potential in developing countries. It exceeds the 437 gigawatts installed capacity in developing countries and 315 gigawatts in North America and Europe. The WBG argues that OECD countries have exploited over 70 per cent of their economically feasible potential whereas about 23 per cent of hydropower potential in developing countries has been exploited and only 7 per cent in Africa (World Bank, 2009).
17. Brazil and China in particular, and South Africa with new carbon tax schemes.

Theme 4. **Low-carbon and renewable policies for the power sector.** Renewable energy and 'green energy' policies are being adopted around the world. Hydropower complements intermittent renewable energy generation (e.g. from wind, solar and tidal generation technologies) to advance low-carbon strategies in national and regional power sectors (IEA, 2012; Delucchi and Jacobson, 2011).

Theme 5. **Shifts in global public attitudes.** Public attitudes are evolving on a range of factors, often pulling in different directions. These include attitudes to nuclear power after Japan's tsunami, expectations for companies and financial institutions to be more attentive to corporate social responsibility commitments, trade-offs related to mitigation of social and environmental impacts of hydropower, climate change, and the relevance of competing electricity demand-supply options in the power sector for climate change mitigation and adaptation strategies.

These trends and challenges are addressed further in Annex 1.

These trends are set against a backdrop of the steady growth in fossil-fuel generation in the global power sector overall, especially coal-fired generation in developing countries,[18] and the large increases in intermittent renewable energy generation, especially wind power, in OECD economies as a percentage of the total.

Financing sources for large hydropower

An understanding of funding sources for dam projects currently in the pipeline worldwide helps assess whether the majority of new large hydropower projects are covered by international environmental and social safeguard policies, or built under national legislation and safeguard regimes only.[19] This offers insights about which standards most often apply.

Table 2 illustrates possible funding sources typical for large hydropower today, along with an indication of the scale of total investment in hydropower they may represent.

18. Coal is part of the mix for new capacity in many developing countries owing to its relative availability and price in international energy markets. The full cost of carbon is not internalised in the price of coal.
19. The environmental and social safeguards associated with OECD and MFI funding streams are often absent when other international sources support new hydropower (such as bilateral support from China).

Table 2. Hydropower investment from different sources

Category of financial support		Types of support	Scale indicator
Domestic capital investment	Includes: ■ state budget allocation (government funding) ■ utility self-investment (from revenue) ■ utility share and bond issues ■ domestic private bank borrowing ■ national public development banks (e.g. ONDES, Brazil)	Where generation is typically owned by a regulated public utility, capital investments are funded in whole or in part by government and the utility supplemented by domestic commercial borrowing and share or bond issues. Where generation is provided by an independent power producer (IPP) they supply equity finance and seek to raise project finance from domestic sources.	■ Among developing countries, China and the rest of Asia dominate in the use of domestic financing sources for hydropower. ■ India and Brazil also have public investment models and independent power producers (IPPs) ■ As Asia represents over 73% of new hydro capacity, a large share of the total hydropower investment in global terms is domestic capital investment (IHA, 2013).
International and regional financial markets	Includes: ■ financial institutions (FIs) that have adopted the Equator Principles (EPFIs) ■ non-Equator-Principle financial institutions ■ International and regional bond and equity markets	■ Project finance (e.g. loan and credit guarantees that look to project revenue to cover risk, not the creditworthiness of the borrower). ■ International bond markets, raising capital based on ratings for the creditworthiness of the issuer (power utilities in the public finance model or IPP developers).	■ Private financial institutions provide between 70% and 80% of all infrastructure financing globally (not only hydropower) (Equator Principles, 2014b). ■ In 2011 EPFIs accounted for half of all global project finance, amounting to US $213 billion across all sectors (Le Clerk, 2012). ■ Many FIs are in Asia where hydro lending is highest. Only one Chinese bank to date subscribes to the Equator Principles (Equator Principles, 2014a). ■ While bond markets are a major source for OECD utilities for capital investment, bond issues are typically limited by creditworthiness in developing countries.
Bilateral export credit agencies (ECAs)	Includes: ■ OECD ECAs ■ Chinese and Hong Kong ECAs ■ other non-OECD ECAs	Various forms of: ■ export credit, credit insurance, guarantees etc. ■ direct lending, intermediary loans, interest rate mechanisms	■ ECAs lend more than all other official sources of financing combined (e.g. World Bank and Regional Development Banks, bilateral and multilateral aid, etc.) (ECA Watch, 2014). ■ OECD ECAs collectively provide $55-70 billion in various financing instruments. A large portion are for industrial and infrastructure projects in developing countries (ECA Watch, 2014).[20] ■ ECAs are a major source of hydropower electrical and mechanical equipment in developing countries. ■ China's Export-Import (Exim) Bank and the China Development Bank (CDB) in 2009 and 2010 issued over $110 billion in concessionary loans to other developing country governments and companies, more than the $104 billion in all sectors that the World Bank loaned over a similar period (FT.com, 2011; Gallagher *et al.*, 2012).

20. In medium- and long-term transactions that include hydropower

Category of financial support		Types of support	Scale indicator
Other bilateral financial support	Includes: ■ OECD ■ China and other non-OECD	Various forms of concessionary finance support at project and/or sector level	■ Chinese power companies support overseas hydropower, especially in Asia and Africa. ■ Some OECD countries only extend support to hydropower via ECAs.
Multilateral financial institutions	Includes: ■ WB Group, ADB, AfDB, IADB, etc. ■ other regional funds (Nordic, OPEC, Arab Funds, etc.)	■ Offer a full range of financing products (credit guarantees, loans, etc) ■ Grants for environment and social management aspects. ■ Multilaterals also 'host; bilateral and multilateral carbon trusts and funds	■ The World Bank Group is the largest single multilateral IFI supporting hydropower and dams. ■ World Bank lending reached US$1 billion by 2008, and is projected to rise to US$2 billion annually over the next several years (World Bank, 2009).
Carbon markets (accessed for hydropower construction or uprating)	Includes: ■ Clean Development Mechanism (CDM) ■ EU Emissions Trading System (ETS) ■ MFI co-ordination support (e.g. WB, IFC, CFU, APCF) (Bretton Woods Project, 2010) ■ OECD bilateral carbon funds ■ China + other non-OECD bilateral carbon funds ■ voluntary carbon markets	■ Carbon financing as a contribution to the revenue stream once the projects are commissioned; e.g. via an Emission Reduction Purchase Agreement (ERPA) ■ Financing support extended for project construction (e.g. a grant allocation from a Carbon Fund) ■ Direct investments in companies by Carbon Funds	■ Global climate finance flows were estimated at $364 billion per year by 2011, with developing countries accounting for some $171 billion (all sectors and types) (Buchner *et al.*, 2012). ■ Hydropower is the largest single technology supported by the CDM (globally 64,000 Megawatts is CDM registered)[21] ■ CDM hydropower accounted for about 381 million certified emission reduction credits (CERs) per year in 2012 (CDM, 2014; UNEP Risoe, 2014). ■ CDM support to hydropower globally thus is valued at $2.0 billion – $2.6 billion per year (assuming an average value of $5-7 per CER).[22] ■ Additional (smaller) hydropower support is via non-compliance/voluntary carbon markets (e.g. airline carbon offset programmes) (Buchner, 2013; Buchner *et al.*, 2012).

21. Data from International Rivers' monitoring of the CDM (International Rivers, 2013); see International Rivers (2014a) and the CDM Registry (UNEP Risoe, 2014).
22. Calculation based on data from CDM registry and prevailing carbon prices for verified emission reductions (VERs) and certified emissions reductions (CERs).

Other qualitative indicators that help paint a broader picture of investment trends are:

- $35 billion was spent globally in 2008 on 25 gigawatts of new large hydropower (UNEP, 2009).
- Between 27 and 30 gigawatts of hydropower and 2-3 gigawatts of pumped storage was commissioned globally in 2012, with Asia accounting for nearly 73 per cent of these capacity additions (IHA, 2013).
- Brazil is planning 23 gigawatts of the 35 gigawatts of hydropower in the pipeline for Latin America, and accounted for most hydropower capacity additions in Latin America in 2012, representing 6 per cent of global hydropower in that year (IHA, 2013).
- Africa accounted for 12 per cent of new hydropower capacity additions in 2012 (IHA, 2013).
- The global trend is towards interconnecting power transmission between countries and the formation of regional power pools, which has significant implications for large hydropower and intermittent renewable energy sources in terms of expanding power markets for them (IEA, 2012).
- Apart from being the single largest user of hydropower domestically, China has become the single largest financer of hydropower in developing countries.[23] Some reports suggest Chinese finance supports half of new dams constructed globally.[24]

Based on this qualitative information, Box 2 outlines the major funding streams for hydropower, particularly for developing countries.[25]

Box 2. Major funding streams for hydropower for developing countries

In descending order of importance:

1. **Domestic investment:** due to Asia accounting for over 73 per cent of new hydropower additions in 2012, coupled with China's support for hydropower in many Asian countries following IPP models. There are regional variations, such as in Africa where MFI and OECD involvement in hydropower activity is higher and public-sector financing is more common.
2. **Commercial financial institution project financing, followed by Equator Principle institution project financing:** non-Equator Principle regional banks dominate project lending in Asia.[26]
3. **ECAs/EXIM support:** combining BRICS EXIMs and OECD EXIMs.
4. **Multilateral financial institution support:** including credit guarantees, concessionary loans and grants from the World Bank, the Asian Development Bank (ADB), the African Development Bank (AfDB), the Inter-American Development Bank (IADB) and other regional banks.
5. **Carbon funds:** from applications by project proponents.
6. **Other bilateral support:** including concessional loans and other hydropower-related financial support for environmental and social management capacity building.

23. Through the three main state lenders in China, as well as a many commercial banks and power utilities.
24. Internal correspondence in 2013 with WWF on 'A China Fund Design Profile' (under preparation); see also Chinafolio (2012).
25. More in-depth and up-to-date data compilation can help to verify and expand the analysis, although it is challenging to obtain comparable data for equivalent projects in equivalent time periods.
26. This figure refers to hydropower. As noted in Section 5.3, the volume of project lending in all infrastructure sectors from EPFIs was three times that for non-Equator Principles institutions.

Women washing laundry at Sélingué dam, Mali, the second largest provider of energy for the country

Photo: Alioune Ba / Global Water Initiative

General observations on the planning and funding landscape

These investment trends have implications for the consideration of environmental and social standards.

- China's dominant role both as a developer of hydropower domestically and the largest single lender (often the sole lender) to other developing countries implies that only national standards and Chinese environmental and social practices will apply to a large portion of the world's new hydropower, by a considerable margin.
- World Bank social and environmental safeguards directly apply to perhaps 3-5 per cent of new hydropower projects, on the basis of lending and support extended by the World Bank Group.[27] Other hydropower projects may indirectly apply World Bank safeguards, for example where OECD bilateral agencies require them to do so.
- The proportion of new hydropower capacity additions in developing countries that must meet the social and environment management requirements of the OECD ECAs is perhaps double the number of projects required to apply World Bank safeguards.
- Hydropower projects are increasingly being funded through institutional consortiums. When many international lenders with different environment and social standards form a financing consortium, generally the 'highest' standard applies. Often the highest is considered to be the World Bank or one of the World Bank Group's safeguard and inspection regime.
- For projects that involve an OECD ECA partner, or EU carbon finance, the 2012 OECD Council recommendation that the WCD and HSAP Sustainable Hydropower Protocol be 'referred to' may establish a higher standard than World Bank safeguards.[28]
- Some observers also suggest the role of Equator Principle financial institutions (EPFIs) in advancing coherence in standards is at a crossroads today. Tensions relating to the implementation of the Equator Standards, and especially the limited uptake in Asia, could endanger the principles' credibility and effectiveness. Other observers argue the Equator Standards are still highly important, especially in relation to China's possible approach to standards and the growth in FI/EPFI project lending for hydropower (see Section 5.3) (Le Clerk, 2012).
- The potential role of standards in gaining access to carbon funds is important in several respects. China has over 60 per cent of hydropower registrations under the Clean Development Mechanism (CDM) and possibly other carbon finance trusts and initiatives to date. China is also beginning to establish its own carbon trading systems. The standards attached to international carbon financing offer practical lessons and shared-learning support for Chinese efforts to advance their own domestic environmental and social management practices and experience.

27. World Bank lending on hydropower reached $1 billion in 2008 while UNDP studies estimate that $35 billion was spent on new hydropower capacity additions in 2008. The WB Group indicates it may double its annual support in the next several years (World Bank, 2009).
28. In the absence of any relevant industry sector EHS Guidelines, ECAs are to 'refer to relevant international sources of guidance such as, for example, where appropriate, the Hydropower Sustainability Assessment Protocol and the Core Values and Strategic Priorities of the World Commission on Dams (WCD) Report for hydro-power projects' (OECD, 2012).

- The EU Linking Directive (European Union, 2004) supports WCD approaches in developing countries, where carbon and/or ECA support may be extended. Moreover, the Linking Directive maintains awareness of the WCD and its fundamental aims in promoting sustainable forms of hydropower development and management.

Overall the data suggest that a majority of new hydropower schemes built today are subject only to environmental and social standards prescribed in national legislation, with no additional dam-specific safeguards put in place by project financers, or to access OECD ECA or EU carbon financing support. Strategies to promote improved social and environmental outcomes from hydropower dams should thus consider how to mainstream best practice into national legislation and capacity as part of the longer-term approach.

The European Trading Scheme and international partnerships

Partnerships with developing countries are an essential part of the European Union's drive to reduce emissions of man-made greenhouse gases by building international carbon markets and advancing climate adaptation (European Commission, 2014). It is important to recognise that emission-saving schemes in China and other developing countries not considered to be among the least developed countries (LDCs) are now excluded from the third phase of the EU ETS, which runs from 2013 to 2020 (Project Developer Forum, 2012). The United Nations classifies some 48 countries as LDCs, including 33 in Africa, 14 in Asia and the Pacific and 1 in Latin America (UN-OHRLLS, 2014). As a group these LDCs collectively account for about 2 per cent of global emissions (Project Developer Forum, 2012).

At the same time, non-LDC developing countries and transitional economies may still participate in other international carbon financing mechanisms, such as the bilateral and regional carbon funds co-ordinated by the World Bank Carbon Finance Unit (CFU) on behalf of OECD countries. Moreover, some BRICS countries, like China and Brazil, are now establishing their own pilot carbon markets and trading systems. Guangdong province in China is reportedly set to open one in December 2013 that will be the second-biggest carbon trading system in the world after the EU-ETS (Chen and Reklev, 2013; China Carbon Forum, 2014). Major Chinese cities such as Shenzhen and Shanghai, and more recently Beijing, have also established carbon trading systems.

The EU is pursuing co-operation with BRICS and other non-LCD developing countries to build an international carbon market. While there are different viewpoints on what linkages to encourage, the financing landscape and trends noted here underscore the importance of this co-operation to build the market, while advancing dam-related environment and social standards.[29]

29. EU policy documents stress the importance of building an international carbon market, supporting developing countries and economies in transition, which is seen as important from mitigation and adaptation perspectives: 'In allowing companies to buy international credits, the EU ETS also acts as a major driver of investment in clean technologies and low-carbon solutions, particularly in developing countries.' (European Commission, 2014).

The World Commission on Dams – approach and intent

3.1 The World Commission on Dams process and report

The WCD was tasked with reviewing the development effectiveness of existing large dams and proposing a set of principles and guidelines that could provide a new framework for decision making around future dams (see Box 3). The commission undertook a multifaceted programme of work to develop the evidence base on which it would make its recommendations. A 68-member forum met regularly to act as a sounding board for the commission. The commission undertook eight independent case studies of large dams with full participation of local actors and four regional consultations were held. In total, 947 contributions came from individuals and 125 dams around the world were assessed through a 'cross-check' survey. These transparent processes created space for exchange and debate on the evidence available, but the policy principles and guidelines in the proposed decision-making framework were the sole work of the commissioners.

Box 3. The World Commission on Dams

The World Commission on Dams was established in February 1998 following an unprecedented process of dialogue and negotiation involving representatives of the public, private and civil society sectors. It began work in May of that year under the Chairmanship of Professor Kader Asmal, then South Africa's Minister of Water Affairs and Forestry and later the Minister of Education. The commission's 12 members were chosen to reflect regional diversity, expertise and stakeholder perspectives.

The WCD was created as an independent body, with each member serving in an individual capacity and none representing an institution or a country. The commission's two objectives were:

- to review the development effectiveness of large dams and assess alternatives for water resources and energy development; and
- to develop internationally acceptable criteria, guidelines and standards, where appropriate, for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.

The commission's report, *Dams and Development – a New Framework for Decision-making*, was released in December 2000.

These principles and guidelines were developed through the application of a 'rights and risks' framework that explicitly set out to broaden the way decisions were made over large dams to involve more stakeholders and to deliberately recognise the rights of different actors and the risks they face in a large dam project.

To do this, the WCD drew on two important elements. Firstly, it articulated the core values involved in the development process, to act as a lens through which to interrogate the evidence base the WCD had gathered. These were:

- equity
- efficiency
- participatory decision making
- sustainability
- accountability

Secondly, it drew on the three critical United Nations (UN) declarations relevant to its work:

- The UN Charter (1945) and the Universal Declaration of Human Rights (1947)
- The UN Declaration on the Right to Development (1986)
- The Rio Declaration on Environment and Development (UN, 1992)

Based on these, the commission proposed that a focus on negotiated outcomes allowed the best balance of meeting rights and reducing risks involving all relevant parties in each stage of project development and/or operation (Figure 5).

Figure 5. Decision making framework proposed by the WCD

Source: WCD (2000).

The commission recommended a set of seven strategic priorities (SPs) to provide a new framework for decision making:

1. gaining public acceptance
2. comprehensive options assessment
3. addressing existing dams
4. sustaining rivers and livelihoods
5. recognising entitlements and sharing benefits
6. ensuring compliance
7. sharing rivers for peace, development and security

Each strategic priority is further broken down into a key message and up to five policy principles. Figure 6 shows the details for SP1: Gaining public acceptance.

Figure 6. Example of a WCD Strategic Priority

Strategic Priority 1
Gaining Public Acceptance

Key message

Public acceptance of key decisions is essential for equitable and sustainable water and energy resources development. Acceptance emerges from recognising rights, addressing risks, and safeguarding the entitlements of all groups of affected people, particularly indigenous and tribal peoples, women and other vulnerable groups. Decision-making processes and mechanisms are used that enable informed participation by all groups of people, and result in the demonstrable acceptance of key decisions. Where projects affect indigenous and tribal peoples, such processes are guided by their free, prior and informed consent.

Effective implementation of this strategic priority depends on applying these policy principles:

1.1 Recognition of rights and assessments of risks are the basis for the identification and inclusion of stakeholders in decision-making on energy and water resources development.

1.2 Access to information, legal and other support is available to all stakeholders, particularly indigenous and tribal peoples, women and other vulnerable groups, to enable their informed participation in decision-making processes.

1.3 Demonstrable public acceptance of all key decisions is achieved through agreements negotiated in an open and transparent process conducted in good faith and with the informed participation of all stakeholders.

1.4 Decisions on projects affecting indigenous and tribal peoples are guided by their free, prior and informed consent achieved through formal and informal representative bodies.

The commission identified five project stages, to which a further 26 technical guidelines apply. The first two stages cover the project scoping and identifying whether a dam is the preferred option. If it is, the last three stages cover project preparation, implementation and operation.

Stage 1 – Needs assessment: validating the needs for water and energy services.
Stage 2 – Selecting alternatives: identifying the preferred development plan from among the full range of options.
Stage 3 – Project preparation: verifying agreements are in place before tender of the construction contract.
Stage 4 – Project implementation: confirming compliance before commissioning.
Stage 5 – Project operation: adapting to changing contexts.

An example of one of the stages (Stage 1: Needs assessment), is shown in Box 4.

Box 4. Application of guidelines during a WCD Stage 1 Needs assessment

SP 1: Gaining public acceptance

- A consultation plan was developed using a stakeholder analysis to define the groups involved. The plan defines mechanisms for verifying needs at the local, sub-national and national level.
- Verification of the needs for water and energy services was achieved through a process of public consultation and the results of this consultation were disseminated to stakeholders. Development objectives reflect a river-basin-wide understanding of relevant social, economic, and environmental values, requirements, functions, and impacts that identifies synergies and potential areas of conflict.
- An appropriate process was established to address any disparities between the needs expressed through the public consultations and the stated development objectives.

SP 2: Comprehensive options assessment

- Legal, policy and institutional frameworks were reviewed and any bias against resource conservation, efficiency and decentralised options, and any provisions that hindered an open and participatory assessment of needs and options, were addressed.

SP 3: Addressing existing dams

- Outstanding social and environmental impacts from past projects were evaluated and incorporated into the needs assessment.

SP 4: Sustaining rivers and livelihoods

- Ecosystem baseline studies and maintenance needs were assessed at a strategic level.

3.2 The commission's intentions

The commission focused in very quickly during its first discussions on how decisions are made, who sits at the table or is consulted and what kind of outcomes these processes lead to. It did not set out to ask whether dams are a good or a bad thing. It compared predicted versus actual outcomes and analysed how multiple small, and some big, decisions taken, often over many years, led to the outcomes observed in countries around the world under different political systems and with different local, national and international actors.

The commission also rapidly realised that every dam is different, embedded in different geographies and cultures and with different local needs and aspirations. There is no 'one size fits all' standard for the design and implementation of large dams. As the executive summary says, '[t]he report is not intended as a blueprint. We recommend that it be used as the starting point for discussions, debates, internal reviews and reassessments of what may be established procedures and for an assessment of how these can evolve to address a changed reality.' (WCD, 2000, p. 36). In taking this approach the commission recognised that the recommendations were aspirational, and that different parties could 'climb the ladder' towards meeting WCD recommendations at different rates, adapting as they went. This is certainly how WCD adaptation and adoption has generally played out.

Ultimately, the commission believed that the key to better outcomes was to ensure adequate information, and then allow local stakeholders to negotiate their preferred outcome in a timely manner that is relevant and appropriate to local reality. The chairman recognised the intensely political nature of this process in his preface:

> Pioneer efforts are bound to be controversial. And while the World Commission on Dams is, by design, strictly advisory, make no mistake. Our genesis, work process and implications of this Final Report are by nature quite political. Our mandate involves the most precious element on earth, and that, of course, involves power: who wields it, how to share it, which ways the state may better balance it. Some may feel this Report makes water use decisions even more difficult; by raising the bar higher... . But in truth we make those decisions easier; for we show clearly which, how, where and why decisions can either work well or fail to deliver. For that reason I assert that we are much more than a 'Dams Commission'. We are a Commission to heal the deep and self-inflicted wounds torn open wherever and whenever far too few determine for far too many how best to develop or use water and energy resources. That is often the nature of power, and the motivation of those who question it. Most recently governments, industry and aid agencies have been challenged around the world for deciding the destiny of millions without including the poor, or even popular majorities of countries they believe to be helping. (WCD, 2000, p. III)

It is for this reason that there are so many considerations of process in the WCD report, and fewer normative standards. The commission firmly believed that how a decision is reached and who sits at the table when decisions are made are the determining factors. As every dam is different, the identification of participants at each stage cannot be predetermined. The most important feature is that outcomes are negotiated, not imposed. This is just as true for water resource mobilisation in international river basins as it is for local communities.

This is perhaps best illustrated by the key message of SP1: Gaining public acceptance: 'Decision-making processes and mechanisms are used that enable informed participation by all groups of people, and result in the demonstrable acceptance of key decisions.'

By proposing, for example, that local stakeholders should agree legally binding or demonstrable agreements, the commission hoped that the information given to inform the participatory process would prove acceptable to local stakeholders, otherwise they would refuse to sign. Equally, written decisions would show, in a more transparent way than hitherto, who exactly was agreeing to what prior to project construction as well as providing a measurable outcome of the consultation process.

This highly participatory approach makes it harder to measure the application of WCD criteria and guidelines as they were not initially conceived as a blueprint of normative standards, and the commission does not address the issue of how (or whether) its approach could be measured.

The Hydropower Sustainability Assessment Protocol

The International Hydropower Association (IHA) works on sustainability issues, recognising that environmental and social outcomes present risks and opportunities for the industry. In March 2008 the IHA updated its 2006 Sustainability Assessment Protocol through a broad participatory approach. It involved key stakeholders, setting up the Hydropower Sustainability Assessment Forum (HSAF). The forum's aim was to develop an enhanced sustainability assessment protocol to measure and guide performance in the hydropower sector, and to provide more consistency in the approach to the assessment of hydropower project sustainability, inclusive of the views of diverse stakeholders.

The revised protocol (HSAP, 2010a) was developed over a two and a half year process of discussion and consensus building and officially launched in May 2011. The 14 forum members included representatives of governments of developed and developing countries, commercial and development banks, social and environmental NGOs, and the hydropower sector.[30] This diverse composition was inspired by the WCD approach and was intended to ensure a range of views led to proposals acceptable to different stakeholder groups. Important reference points for the protocol included the World Commission on Dams 2000 report, the UNEP Dams and Development Project, the IFC Performance Standards, the safeguard policies of the World Bank and other multilateral institutions, international standards, and numerous UN declarations and conventions (HSAP, 2010b, p. 12).

The protocol was conceived to measure performance of individual dam projects at different stages from conception to operation (see below). It is not seen as a performance 'standard' (see Terms and conditions, Article 3.1) nor is it to be used to claim certification of any particular project as 'sustainable' (Article 4.3) or to give a pass/fail (see Box 5) (HSAP, 2011).

30. For a list of forum members see HSAP (2010a). Stakeholder interests represented included: developing countries (China Institute of Water Resources and Hydropower Research, China Hydropower Engineering Consulting Group Co.; Ministry of Energy and Water Development, Zambia); developed countries (Department of Energy, Norad, Norway; National Energy Authority, GTZ (now GIZ), Germany [observer]); environmental aspects (The Nature Conservancy; World Wide Fund for Nature); social aspects (Oxfam; Transparency International); financial sector/economic aspects (Citigroup Global Markets Inc., member of the Equator Principles Financial Institutions; World Bank [observer]) and the hydropower sector (International Hydropower Association; Hydro Tasmania; Sustainable Finance Ltd).

Box 5. The Hydropower Sustainability Assessment Protocol (HSAP)

What the protocol is:

- a method for the assessment of individual projects against globally applicable criteria
- a series of assessment tools applicable to all stages of hydropower development in all global contexts
- an evidence-based objective assessment of a project's performance, prepared by an accredited assessor
- developed and governed by a multi-stakeholder, consensus-based structure.

What the protocol is not:

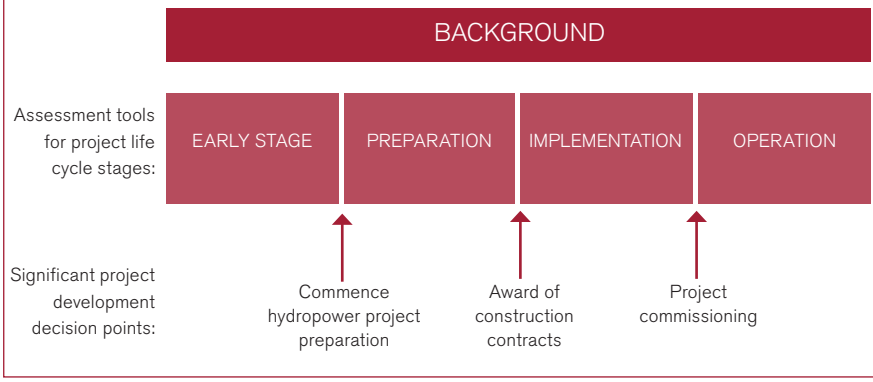
- a standard, or a pass/fail mark – it provides the means to improve the sustainability of specific topics within a project
- a mechanism to provide a 'sustainable hydropower' or 'certified' stamp of approval
- a replacement for national or local regulatory requirements
- a replacement for an EIA or ESIA required to meet regulations or international lender's demands (rather the protocol assesses the quality and extent of EIAs undertaken).

Source: HSAP (2014a).

Protocol structure

The protocol comprises five documents – the background document and four assessment tools for the different stages of the project life cycle, as shown in Figure 7 below.

Figure 7. The four key phases to which the HSAP applies



Source: HSAP (2010b).

The four assessment tools – Early Stage, Preparation, Implementation and Operation – are designed to be stand-alone assessments applied at particular stages of the project life cycle. An assessment with one tool does not require earlier stage assessments to have been undertaken. The assessment tools are designed to be applicable up to major decision points in the project life cycle (shown in Figure 7), and are most effective where there are repeat applications to help guide continuous improvement measures.

The protocol is conceived as a tool for constant review and improvement and it anticipates that a project may be reviewed several times over the course of a ten or fifteen year period and evolve towards best practice as a result of an iterative cycle of assessment and improved practice.[31] This intention will only prove viable if there is an incentive for dam operators to seek continual improvement and justify the expense of undertaking the assessment.

Scoring

For each sustainability topic, the assessment process identifies two key levels:

- Level 3 describes basic good practice on a particular sustainability topic. Level 3 statements have been designed with the idea that projects in all contexts should be working toward such practice, even projects in regions with minimal resources or capacities, or smaller-scale, less complex projects.
- Level 5 describes proven best practice on a particular sustainability topic that is demonstrable in multiple country contexts. Level 5 statements have not been designed to be easy to reach, but have been shown to have been attained in multiple countries, and not just by the largest projects with the most resources at their disposal. It would be very difficult to reach Level 5 on all topics, because practical decisions need to be made on priorities for corporate/project objectives and due to constraints on the availability and allocation of resources (time, money, personnel) and effort.

Other levels are then established in relation to either basic good practice or best practice as follows:

- Level 1 – there are significant gaps relative to basic good practice.
- Level 2 – most relevant elements of basic good practice have been undertaken, but there is one significant gap.
- Level 4 – all elements of basic good practice have been undertaken and in one or more cases exceeded, but there is one significant gap in the requirements for proven best practice.

Each topic area has a set of issues associated with Level 3 and Level 5, as well as guidance as to what possible indicators or evidence are available to measure project achievement at each level. An example for one topic area is given in Annex 2.

31. The WCD recommended multi-stakeholder, periodic assessments of large dams, in addition to the monitoring and evaluation undertaken normally by the project operator such as to comply with environment laws.

Although the HSAP was finalised in 2010, at the time of writing only seven projects have been published under the protocol (see Section 4.3). Uptake has therefore been gradual and it remains to be seen whether the industry as a whole believes the benefits of publishing transparent data on outcomes outweigh the risks and costs in doing so.[32]

The protocol is not owned by the IHA but by a separate governance structure with different 'chambers' populated by representatives of key stakeholder interests, to ensure that it is independent from IHA control or unilateral intervention. There will doubtless be different perceptions of the degree to which this has been achieved, and for many observers a combination of some assessors being drawn from ex IHA staff and the IHA continuing to provide a strong promotion and secretariat function for the protocol may not fully allay their concerns. The acceptability of the HSAP process to all local stakeholders will ultimately depend on its degree of real and perceived independence.

4.1 The HSAP and WCD compared

The HSAP adopts a four-stage approach from options assessment through to operation. The WCD report establishes a set of core values and seven strategic priorities that cut across all phases of project planning and operation, which makes them hard to compare on a one-to-one basis. While the WCD guidelines do apply at different stages, it is the strategic priorities that have received most buy in, with the guidelines being seen as overly prescriptive.[33] This comparison therefore focuses primarily on the intention of the WCD in laying out its strategic priorities and the intention behind the HSAP. The WCD guidelines are drawn on as and when specific details arise.

There is a risk in this process of comparing apples and oranges. The ultimate aims of the two processes are similar but they adopt two very different pathways. The WCD set out to establish a framework within which decisions could be adapted to local contexts and not to provide a blueprint. It addressed the whole planning process at the sectoral or basin level. The HSAP addresses individual projects and sets out to establish a gradual approach to achieving good practice through a set of assessments within which a project can be scored according to progress towards best practice on that issue. The idea is that repeated scoring over time (5, 10, 20 years) will ensure that each project assessed has the opportunity to move towards best practice over that period. The HSAP approach allows for a sliding scale of achievement within each topic area, which the WCD does not.

32. Assessments are undertaken by one or more HSAP-accredited assessors. Candidates seeking accreditation initially participate in two assessments as 'assessors in training' to ensure a standardised application of criteria. Nine assessments have been completed and five have been made public on the IHA website. In one case, the team reviewed 167 documents and conducted 65 interviews of different stakeholders. Cost estimates for delivering an assessment range from $50,000 for smaller-scale projects to $130,000 for large-scale projects that may require more interviews and stakeholder consultations (IHA personal communication).
33. The WCD guidelines were mainly intended for countries to use in the event there was no comparable national guidance or experience on a particular issue.

In this assessment, we have considered whether or not the WCD intention is fully met through the HSAP measure of what constitutes 'best practice' (Level 5), although in practice the HSAP recognises that few projects will reach Level 5 for all topic areas, at least initially.

HSAP Early Stage tool

Figure 8 shows the WCD recommendations for SP 2: Comprehensive Options Assessment.

Figure 8. WCD Strategic Priority 2

Strategic Priority 2
Comprehensive Options Assessment

Key message

Alternatives to dams do often exist. To explore these alternatives, needs for water, food and energy are assessed and objectives clearly defined. The appropriate development response is identified from a range of possible options. The selection is based on a comprehensive and participatory assessment of the full range of policy, institutional, and technical options. In the assessment process social and environmental aspects have the same significance as economic and financial factors. The options assessment process continues through all stages of planning, project development and operations.

Effective implementation of this strategic priority depends on applying these policy principles:

2.1 Development needs and objectives are clearly formulated through an open and participatory process before the identification and assessment of options for water and energy resource development.

2.2 Planning approaches that take into account the full range of development objectives are used to assess all policy, institutional, management, and technical options before the decision is made to proceed with any programme or project.

2.3 Social and environmental aspects are given the same significance as technical, economic and financial factors in assessing options.

2.4 Increasing the effectiveness and sustainability of existing water, irrigation, and energy systems are given priority in the options assessment process.

2.5 If a dam is selected through such a comprehensive options assessment process, social and environmental principles are applied in the review and selection of options throughout the detailed planning, design, construction and operational phases.

The HSAP Early Stage assessment tool has nine specific topic areas for the equivalent of the WCD comprehensive options assessment:

ES-1 Demonstrated need
ES-2 Options assessment
ES-3 Policies and plans
ES-4 Political risks

ES-5 Institutional capacity
ES-6 Technical issues and risks
ES-7 Social issues and risks
ES-8 Environmental issues and risks
ES-9 Economic and financial issues and risks

The Early Stage assessment tool differs from the other three assessment tools in that it is an assessment guide but not a scoring protocol.[34]

The intent of the WCD was to ensure that three steps were taken before a dam was selected as the best option:

1. The development needs have been clearly identified.
2. All ways to meet those needs have been screened and a dam is recognised as the best option, or part of the best mix of options.
3. The efficiency of existing dams has been increased before investing in new ones.

Steps 1 and 2 should be undertaken through a fully participatory process, giving equal weight to social, environmental, financial and economic perspectives.

In practice, dams meet a whole range of development needs, depending on the context. They may deliver hydropower, flood management, or storage for irrigation and drinking water and sometimes all of these. While in some contexts dams are predominantly single purpose, where dams are multipurpose it is extremely challenging to run cross-sectoral reviews to look simultaneously at all options for all sectors, and there is rarely a lead organisation capable of, and mandated, to run such a process. River basin agencies are emerging as the main structure capable of doing this within the water sector, and as their capacity grows, this form of planning may increasingly become a reality. Integrated Water Resources Management (IWRM) principles also require the inclusion of civil society and participatory planning approaches in line with WCD proposals (Global Water Partnership, 2014).

In the short term, however, there are very few countries able to deliver a WCD-style process in a participatory manner. The IHA has therefore taken a pragmatic approach and most of the plans and policies that the protocol refers to in its options assessment remain sector-specific (e.g. 'Needs for water and energy services are those identified through broadly agreed local, national, and regional development objectives, policies and plans'). The IHA is focused solely on hydropower which is simpler in planning terms than other sectors. The existence of such plans and policies is a key consideration which is assessed by the protocol, however there remains the challenge of assessing the degree of participation, and acceptance of those plans by different stakeholders, which is key to assessing coherence with the WCD.

34. The Early Stage assessment guide offers reasons for not scoring, including the fact that project details are not formulated at that stage. Otherwise, early stage assessment applies more to the government's regulatory framework and policy/strategic planning at either the sector or basin levels.

The WCD also assumes that it is always administratively feasible to invest in existing dams prior to building new ones, implying that financing is not project specific. The reality is rather different and requires clear financial bridges between projects to allow improvements to existing dams to be prioritised. A private-sector financier prepared to invest in project A will not necessarily be interested in upgrading project B if it is run by another owner/operator. In cases where all dams are owned and operated by the government, or a single national operator, such transfers may be easier. The HSAP presents this issue as one part of the 'options assessment' without giving it the priority afforded by the WCD.

The HSAP focuses on identifying the existence of such things as river basin plans, national policies, and sectoral programmes. The 'advanced expectations' at Level 5 ask for 'a high quality approach to options assessment, for example through the breadth of planning approaches considered, … engagement of stakeholders in the analysis of options, … strongly emphasizing regional/basin-wide approaches'. For the time being there appear to be few agreed measurable indicators that go beyond whether the plan exists to assessing the breadth and depth of the process through which that particular plan was adopted, who participated, what options were looked at, what strategic environmental and social assessments were made to guide decisions at each stage, and so on. As each country also adopts a different planning process, and each river system may have national and transboundary components, a fully documented WCD-style approach appears to be a medium-term aspiration.

Environmental and social risks are screened and assessed using the HSAP Early Stage tool and set the scene for the more detailed assessments proposed in the preparation stage. This explicitly incorporates the concept of risk management into planning as articulated by the WCD. It remains to be seen what kind of documentation is available on this topic as these kinds of risk assessment are not currently common practice, particularly for social issues. The proposal in the protocol may therefore promote innovation in new approaches and techniques for assessing the risks listed, particularly under ES-7 and ES-8.

HSAP Preparation Stage tool

The HSAP includes 23 topics to be addressed during the preparation stage (see Table 3). They include a number of provisions that were of concern to the HSAF members, such as dam safety or hydrological assessments, even though these may not have been the focus of the WCD, which was more preoccupied with how decisions were made.

Table 3. Topics for the HSAP Preparation Stage

P-1 Communications and consultation P-2 Governance P-3 Demonstrated need and strategic fit P-4 Siting and design P-5 Environmental and social impact assessment and management P-6 Integrated project management P-7 Hydrological resource P-8 Infrastructure safety P-9 Financial viability P-10 Project benefits P-11 Economic viability P-12 Procurement	P-13 Project-affected communities and livelihoods P-14 Resettlement P-15 Indigenous peoples P-16 Labour and working conditions P-17 Cultural heritage P-18 Public health P-19 Biodiversity and invasive species P-20 Erosion and sedimentation P-21 Water quality P-22 Reservoir planning P-23 Downstream flow regimes

Table 4 compares each of the HSAP topic areas with WCD. Annex 2 shows an example of their internal structure.

Table 4. Analysis of topics for the Preparation Stage against the WCD

P-1 Communications and consultation
The WCD did not address communication as a specific measure, but explicitly proposed informed consent and negotiated outcomes which are only possible with a full communication process with stakeholders. The HSAP includes concrete measures to assess this, going further in articulating good-faith negotiations and grievance mechanisms as a key component of good practice. The protocol stresses the need for good stakeholder identification and engagement which is a pre-requisite for establishing agreements as outlined in P-13.
P-2 Governance
The WCD didn't say much about good internal governance within developers, beyond a reference to corruption under the compliance measures incorporated in SP 6: Ensuring compliance. The HSAP goes beyond this to assess the degree to which internal governance of project developers meets high corporate standards, including transparency, third party review and anti-corruption measures.
P-3 Demonstrated need and strategic fit
This topic relates back to the Early Stage assessment and is subject to the caveat that this should be addressed in strategic planning processes undertaken or led by government.
P-4 Siting and design
The intent of the HSAP is that siting and design are optimised as a result of an iterative and consultative process that has taken into account technical, economic, financial, environmental and social considerations. This again links back to the Early Stage process of options assessment and best practice would include effective stakeholder engagement. In this sense it meets the WCD intention of ensuring that all options are assessed in an effort to reduce impacts, and that this process should be fully participatory. As with P-13, measuring the effectiveness of the participatory process remains an outstanding question.

P-5 Environmental and social impact assessment and management
The protocol includes provision for the assessment of cumulative impacts, cultural heritage, and rights and risks, as well as promoting independent review, all of which are key components of the WCD's intentions. The reference to risks and human rights (a key part of the WCD framework) appears as a Level 5 requirement rather than a Level 3 requirement. WCD proposed a two-stage environmental impact assessment (EIA) process including a scoping phase that allowed stakeholder concerns to be raised, and subsequently addressed during the full EIA process. The HSAP makes no reference to this, however it does specifically include environmental management systems (e.g. ISO 14001)[35] and anti-corruption measures which the WCD refers to in passing (under SP 6: Ensuring compliance and Guideline 21: Compliance plans).
P-6 Integrated project management
The HSAP stresses (along with P-2: Governance) the need for individual developers (often referred to as companies) to have the necessary in-house skills, capacities and processes to engage in project planning and construction. This was not a priority for the WCD.
P-7 Hydrological resource
The basic premise is to fully understand the river hydrology and to develop appropriate models and scenarios that can ensure efficient use of available resources in a context of climate change through an 'iterative and consultative process'. The WCD includes this measure under SP2: Options assessment as a risk related to the sustainability of future benefits, as well as under Guideline 11 (Economic risk assessment). Part of the provisions on operating rules also link to WCD Guideline 12 (Ensuring operating rules reflect environmental and social concerns).
P-8 Infrastructure safety
This was not a WCD priority, although Guideline 12 (Ensuring operating rules reflect environmental and social concerns) and Guideline 13 (Improving reservoir operation) mention ensuring safety of local people and safety of the infrastructure. This HSAP topic proposes demonstration of existence of plans, communication programmes, simulations and assessment of a wide range of safety risks.
P-9 Financial viability
The HSAP's intent was that projects proceed with a sound financial basis that covers all project funding requirements including social and environmental measures, financing for resettlement and livelihood enhancement, delivery of project benefits, and commitments to shareholders/ investors. It make specific reference to risk assessment, scenario testing and sensitivity analyses which the WCD encouraged private sector actors to adopt (WCD Guideline 11: Improving economic risk assessment). To reach Level 5, the HSAP states 'financial management plans provide for well-considered contingency measures for all environmental and social mitigation plans and commitments; and processes are in place to anticipate and respond to emerging risks and opportunities'. This speaks to the need for flexibility and addresses 'unanticipated impacts' under the WCD terminology.

35. See http://en.wikipedia.org/wiki/ISO_14000

P-10 Project benefits
The HSAP intent is that opportunities for additional benefits and benefit sharing are evaluated and implemented, in dialogue with affected communities, so that they are delivered to communities affected by the project. This responds directly to WCD SP 5: Recognising entitlements and sharing benefits. The WCD states 'These provisions recognise entitlements that improve livelihoods and quality of life, and affected people are beneficiaries of the project' (p. XXXV) and 'adversely affected people are recognised as first among the beneficiaries of the project' (Strategic Principle 5.4). The Level 3 outcome for this topic is 'Plans deliver benefits for communities affected by the project' while the Level 5 outcome is 'In addition, plans deliver significant and sustained benefits for communities affected by the project'. The HSAP topic guidance refers to access to electricity, non-monetary benefits and revenue sharing, all of which are included in WCD Guideline 20 (Project benefit-sharing mechanisms). Some possible benefits, for example access to irrigated land, are not mentioned as the HSAP focuses on hydropower not irrigation.
P-11 Economic viability
The WCD addressed this issue as a matter of risk assessment (e.g. Guideline 11) while the HSAP sees communicating the economic cost-benefits of the project as good practice. The financial aspects may be commercially sensitive.
P-12 Procurement
The WCD did not specifically address this issue, beyond citing the need for anti-corruption processes, transparency, and local procurement and employment opportunities for affected communities. All these are addressed in the HSAP, which goes further into the details of a company's procurement processes and the risks of the supply chain notably during construction.
P-13 Project-affected communities and livelihoods; P-14 Resettlement; P-15 Indigenous peoples
The protocol lays out general principles for all affected communities under P-13. P-14 specifically addresses those affected requiring resettlement and P-15 refers to the specific needs of indigenous peoples throughout the project development process. The WCD did not separate out these issues in quite the same way so these three are considered together as a group. The intent under P-13 is that livelihoods and living standards for communities impacted by the project are improved relative to the conditions before the project, with the aim of self-sufficiency in the long term, and that commitments to project-affected communities are fully delivered over an appropriate period of time. The WCD also made a strong case that affected people's livelihoods should be improved as a result of dam projects (SP 5: Recognising entitlements and sharing benefits). The Level 3 standard states that 'Affected communities generally support or have no major ongoing opposition to the plans for the issues that specifically affect their community' with an outcome of 'Plans provide for livelihoods and living standards impacted by the project to be improved, and economic displacement fairly compensated, preferably through provision of comparable goods, property or services'. Level 5 states 'In addition, formal agreements with nearly all the directly affected communities have been reached for the mitigation, management and compensation measures relating to their communities'.

This coincides with the WCD's proposal that formal negotiated agreements are required to show that 'demonstrable agreement' has been reached (SP5.4: Mutually agreed and legally protected benefit sharing mechanisms are negotiated to ensure implementation). This links back to P-1 where it is essential to correctly identify stakeholders and their representatives. An outstanding question for both the WCD and HSAP is who really speaks (and 'signs') on behalf of communities. There may be conflicting views that an assessor will have to judge.

The main decision-making process under P-14 is the resettlement action plan. Here, to reach Level 3 there needs to be no stakeholder opposition to the plan while Level 5 refers to existence of binding legal agreements with host and resettled communities. This Level 5 commitment is in line with WCD recommendations.

Under P-15, the HSAP recognises indigenous peoples as a special case: 'This topic addresses the rights, risks and opportunities of indigenous peoples with respect to the project, recognising that as social groups with identities distinct from dominant groups in national societies, they are often the most marginalized and vulnerable segments of the population. The intent is that the project respects the dignity, human rights, aspirations, culture, lands, knowledge, practices and natural resource-based livelihoods of indigenous peoples in an ongoing manner throughout the project life.' The HSAP forum expressed a need to revisit the wording of this topic if there are significant developments on this issue. Gaining free, prior and informed consent is a Level 5 requirement. The WCD recommended that 'Where projects affect indigenous and tribal peoples, such processes are guided by their free, prior and informed consent.' (SP 1: Gaining public acceptance).

WCD further recommended (SP 1.2) that 'Access to information, legal and other support is available to all stakeholders, particularly indigenous and tribal peoples, women and other vulnerable groups, to enable their informed participation in decision-making processes.' HSAP does not refer specifically to the need for legal support, but it does recognise the need for information (P-1, above).

P-16 Labour and working conditions

This topic addresses institutional health and safety issues and labour rights. These were not addressed by the WCD.

P-17 Cultural heritage and P-18 Public health

The WCD addressed these issues as one component of the environmental and social impact assessment and did not make specific recommendations.

P-19 Biodiversity and invasive species

The HSAP records the intention as being 'That there are healthy, functional and viable aquatic and terrestrial ecosystems in the project-affected area that are sustainable over the long-term, and that biodiversity impacts arising from project activities are managed responsibly'.
This is a significantly different approach to that of the WCD which states (SP4: Sustaining rivers and livelihoods):

> 4.3 A national policy is developed for maintaining selected rivers with high ecosystem functions and values in their natural state. When reviewing alternative locations for dams on undeveloped rivers, priority is given to locations on tributaries.
> 4.4 Project options are selected that avoid significant impacts on threatened and endangered species. When impacts cannot be avoided viable compensation measures are put in place that will result in a net gain for the species within the region.

The HSAP approach puts all 'biodiversity' on a similar level, while the WCD specifically recognises the special treatment to be afforded to 'threatened and endangered' species that are already rare and will be further affected by the project. As these species often have very specific habitat requirements, or pressures on their numbers (which is why they are rare), they may require specific plans. The HSAP recognises the notion of 'threatened biodiversity' in its topic explanation but this is not followed through as a structuring concept in the detailed guidance. The *IHA Assessors Handbook* does however say 'Particular attention is usually paid to rare, threatened or endangered habitats and species', which it then goes on to define. The use of the term 'usually' only serves to add ambiguity.

At a structural level, functioning natural riverine ecosystems preserve the entirety of the natural biodiversity in an unmodified state and create refuges for key species assemblages. The WCD felt that maintaining some of the most valuable rivers in their natural state, while developing dams on less ecologically valuable rivers, or at least on tributaries rather than the mainstream, served to improve long-term environmental quality (SP 4.3: A national policy is developed for maintaining selected rivers with high ecosystem functions and values in their natural state). Equally, the process of developers establishing an environmental baseline for such a policy provides important contextual information against which long-term (and often cumulative) impacts can be measured. The HSAP does include the need for baseline information, but this is only at the individual project/river scale. If there is a population of river dolphins, say, in a particular river, it is important to know whether this group is one of only five such groups nationally or one of a hundred such groups in order to understand and justify project choices on mitigation. Such information is arguably contained in the Level 5 requirement for 'Broad contextual considerations: a catchment or river basin perspective', however this falls short of the WCD's more holistic view of river biodiversity management. This is another example of where individual dam developers cannot always meet WCD recommendations that require action at a broader scale.

P-20 Erosion and sedimentation and P-21 Water quality

The WCD did not address these issues in detail. There is some reference to them under SP 3.2: Addressing existing dams. 'Programmes to restore, improve and optimise benefits from existing large dams are identified and implemented. Options to consider include rehabilitate, modernise and upgrade equipment and facilities, optimise reservoir operations and include non-structural measures to improve the efficiency of delivery and use of services.' Guideline 12 (Ensuring operating rules reflect social and environmental concerns) and Guideline 14 (Baseline ecosystem surveys) are also relevant. However, in general the WCD did not have much to recommend on these issues.

P-22 Reservoir planning

The HSAP covers very similar ground to WCD Guideline 13 (Improving reservoir operations).

P-23 Downstream flow regimes

The intent for this topic is that flow regimes downstream of hydropower project infrastructure are planned and delivered with an awareness of environmental, social and economic objectives affected by those flows, and measures are incorporated to address them.

Level 3 requires consideration of the 'magnitude, range and variability of the flow regimes' with an outcome that 'Plans for downstream flows take into account environmental, social and economic objectives, and where relevant, agreed transboundary objectives.' This reflects the recommendations of the WCD.

Comparing WCD and HSAP requirements

Table 5 gives an overview of those HSAP and WCD recommendations that can be easily compared, offering an overall assessment of coherence for the Level 3 and Level 5 requirements. For some WCD recommendations, the HSAP would meet them at Level 3, for others only at Level 5 and it falls short on two.

Table 5. Overview comparison between WCD and HSAP

	Level at which compatibility with WCD reached		
HSAP topic	**Level 3**	**Level 5**	**Comment**
P-1 Communications and consultation			
P-3 Demonstrated need and strategic fit			Level 3 does not require participation of stakeholders
P-5 Environmental and social impact assessment and management			Insufficient clarity concerning ecological baseline surveys.[36] Reference to human rights is a Level 5 requirement but was fundamental to the WCD construct.
P-10 Project benefits			
P-13 Project-affected communities and livelihoods			The WCD put significant emphasis on negotiation and demonstrable agreements. The latter is a Level 5 requirement for the HSAP.
P-14 Resettlement			As above
P-15 Indigenous peoples			Free, prior and informed consent is a Level 5 requirement
P-19 Biodiversity and invasive species			The HSAP gives insufficient weight to the importance of ecological baseline surveys and special treatment of endangered and threatened species.
P-23 Downstream flow regimes			

Generally meets WCD aspirations (SPs)	
Generally does not fully meet WCD aspirations (SPs)	

36. This includes baseline surveys of the river affected by the dam, and the immediate reservoir area, but also the knowledge of similar biodiversity elsewhere in the region that allows some assessment to be made of how significant the project impacts are likely to be at the population level.

4.2 WCD provisions not fully reflected in the HSAP (preparation phase)

Negotiated outcomes

The WCD puts significant emphasis on the empowerment of local communities and stakeholders to participate in decision making in such a way as to ensure negotiated and agreed outcomes.

The HSAP uses the terms stakeholder engagement, consultation, feedback and lack of stakeholder opposition to cover this notion (P-1). Where the Level 5 requirement is for a legally binding agreement or a signed document (P-13), the reference point is very clear and can be evaluated. At lower levels, the degree of consultation and participation in decision making is much harder to measure and define. P-1 asks for appropriately timed communications and engagement, two-way engagement, and good faith, all of which are defined further in the guidance or IHA handbooks. The WCD was aware of this challenge, which is why it stated that a 'demonstrable agreement' (SP 1.3) or a 'legally binding agreement' were necessary as this showed that the process of consultation had reached a mutually agreeable conclusion. Consultation processes, especially in oral cultures, are extremely challenging to measure and in some cases simply holding a meeting is considered consultation. More thought may be needed on how best to measure the degree of 'meaningful' consultation when this has not (yet) led to a written agreement (see also Annex 6 for how the IFC is addressing this complex issue).

Legal support

The WCD proposed that this was essential in order to support local people in their negotiations due to the power imbalance between communities and government (SP 1.2).

Participatory options assessment

The WCD proposed that development needs and alternative ways to address them should be the subject of a participatory process. The HSAP has taken the more pragmatic approach of listing the plans and policies in existence, with less emphasis on how those plans and policies were developed and with what degree of participation.

Ecosystem management

The WCD recommended comprehensive environmental baseline surveys as a basis for managing ecosystem impacts. It further proposed an 'intact rivers policy', avoidance of construction on the main stem of a river where tributaries were available, and strategies for focusing on threatened and endangered species. This broad approach contrasts with the HSAP's more focused concentration on the presence or absence of EIAs and plans, and while endangered biodiversity appears as part of the topic 'intention', the notion of specific action for endangered or threatened species does not appear in the topic guidance. The assessment for Hvammur illustrates this (HSAP, 2013). Vulnerable and rare species are present on the site, but the assessors have not been able to drill down to understand how (or whether) mitigation plans intend to prevent their disappearance.

Compliance

The WCD put significant emphasis on compliance with rules and regulations (SP6: Ensuring compliance). Individual measures, expressed in different language, are scattered through the HSAP, sometimes under corporate governance, sometimes under procurement, sometimes under integrated project management. The WCD made the point that compliance is about establishing trust and confidence between partners and with stakeholders. This value-laden language is not really reflected in the HSAP assessments, but the technical 'nuts and bolts' of many compliance issues can be found, even if the WCD language referring to 'legally binding plans', for example, is not evident in the HSAP beyond commitments to affected communities. More light will be shed on this issue when more of the HSAP assessments are published and their content can be reviewed showing examples of the ways in which the issue is addressed on a project by project basis.

National policy provisions

The WCD made a number of proposals about the broader national policy framework, for example relations with neighbouring riparian states (SP 7: Sharing rivers for peace, development and security). These are not reflected in detail in the HSAP which treats transboundary issues as a cross-cutting topic. In most cases transboundary issues are addressed by river basin organisations cases and may be considered beyond the remit of the IHA or hydropower developers.

4.3 Comparing the WCD and HSAP approaches

The WCD established a new framework for decision making. In doing so, it did not set out to be normative and set standards for every strategic priority, nor did it consider that the wording of its recommendations should be expressed in such a way as to be fully measureable. This is probably just as well as many of its recommendations concerned the nature of decision-making processes that are challenging to monitor and evaluate.

The forum that developed the HSAP had the opportunity to see what the WCD had proposed and to ask how functional and applicable the measures were to practical cases in the field. In doing so it had to address the aspirational nature of many of the WCD recommendations. The HSAP preferred to establish a graded approach where countries, and projects, could progress and improve their practices, learning and adopting new techniques and approaches as they went, hoping eventually to reach a Level 5 assessment that would be close to some of the aspirations set out by the WCD. The HSAP background document says '5s on all topics would be very difficult to reach, because practical decisions need to be made on priorities for corporate/project objectives and availability/allocation of resources (time, money, personnel) and effort' (HSAP, 2010b). Until more examples of HSAP assessments are publicly available, it will be hard to see exactly where projects lie on this scale, and how quickly they may hope to progress towards a Level 5 score and on which topics (note however that the assessments shown in Figure 9 and Figure

10 suggest that scores of Level 5 have proved to be more common than perhaps initially expected). At this point we should be better able to compare these with the results of the WCD compliance assessments undertaken, for example, under the EU Linking Directive.

The HSAP background document states that the protocol should not be used to claim that projects are or are not sustainable, nor should there be a 'pass' or 'fail' when the standard is applied. Yet this is the purpose that many in the world of dams and financing would want to put it to, were it to be widely adopted. It also remains to be seen whether assessments, once published, are strongly contested or not and by whom, and whether dam proponents or operators regard assessment and publication to be in their best long-term interests.

In contrast to the WCD, which simply published its protocol and disbanded, the IHA has put in place both a process for accrediting assessors and an independent council for governing the terms and conditions and the (possibly evolving) content of the HSAP. There is therefore a strong ownership of the method, and presumably the results when they appear. While the HSAP is publicly available for use by anyone, the IHA distinguishes between official and unofficial use. Official use requires an HSAP assessor and publication of the report on the web, with a 60-day comment period. At present there is little clear incentive to carry out an official assessment and dam proponents may feel they are opening their projects up to unnecessary scrutiny and risk unless financiers make it a condition for funding. On the other hand, clear, transparent assessments can only boost developers' reputations, particularly when the protocol assessors find positive messages in the way projects are being delivered. Even if the results are not made public they can result in internal changes to improve policy and practice.

By November 2013, according to the IHA, they had received applications for assessments in the 'double figures' and six assessors have been formally accredited. Nine assessments have been undertaken, of which seven are in the public domain (Table 6) with reports available on the web. Of these, two assessments apply to the preparation stage, two to the implementation stage and three to the operation stage protocol.

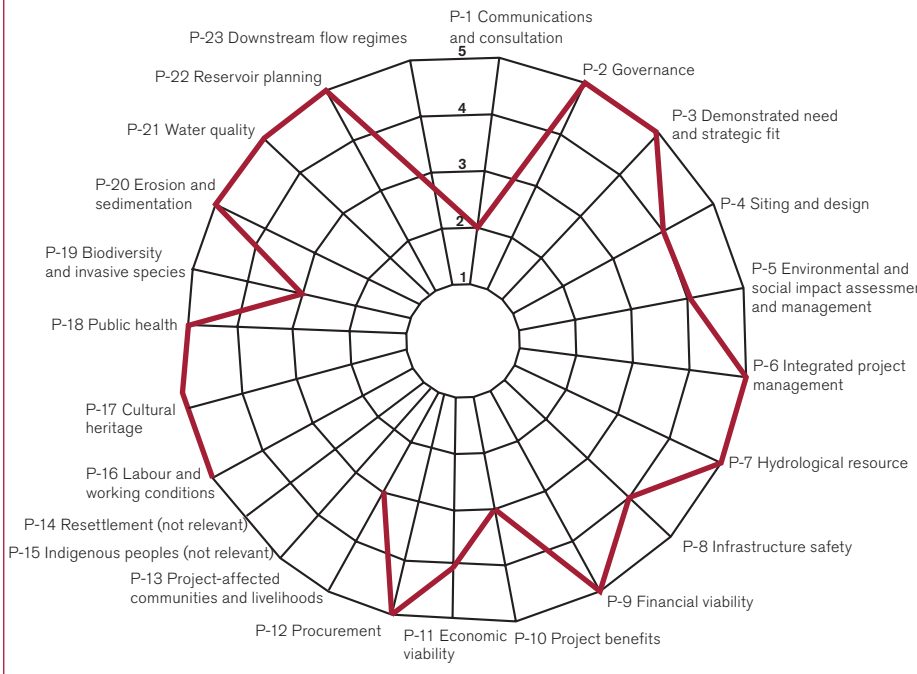
One considerable advantage of the HSAP results format is that assessments can be presented clearly as a single spider diagram, which is a large step forward from WCD. Figure 9 shows the result for a project in preparation and Figure 10 for a project in operation, and both clearly illustrate their strengths and weaknesses in individual topics. Even though both these projects operate in sophisticated regulatory environments, the scores are not Level 5 throughout, which suggests that the HSAP has set a fairly high standard for 'best practice' and many dam proponents and managers will find scope to assess their approaches and make appropriate improvements. Resettlement and benefit sharing have not yet been assessed as no people were displaced by the projects assessed so far.

Table 6. HSAP assessments available as at 30 Nov 2013

Project	Type	Date	Region	Project stage	MW capacity
Romanche-Gavet	Official assessment	18 Sep 2013	Europe	Implementation	94
Keeyask	Official assessment	18 July 2013	Europe	Preparation	695
Jirau	Official assessment	17 May 2013	Americas	Implementation	3750
Hvammur (Iceland)	Official assessment	10 May 2013	Europe	Preparation	82
Jostedal (Norway)	Official assessment	10 May 2013	Europe	Operation	288
Walchenseekraftverk (Germany)	Official assessment	10 May 2013	Europe	Operation	124
Trevallyn (Tasmania)	Pilot assessment	04 Apr 2012	Oceania	Operation	96

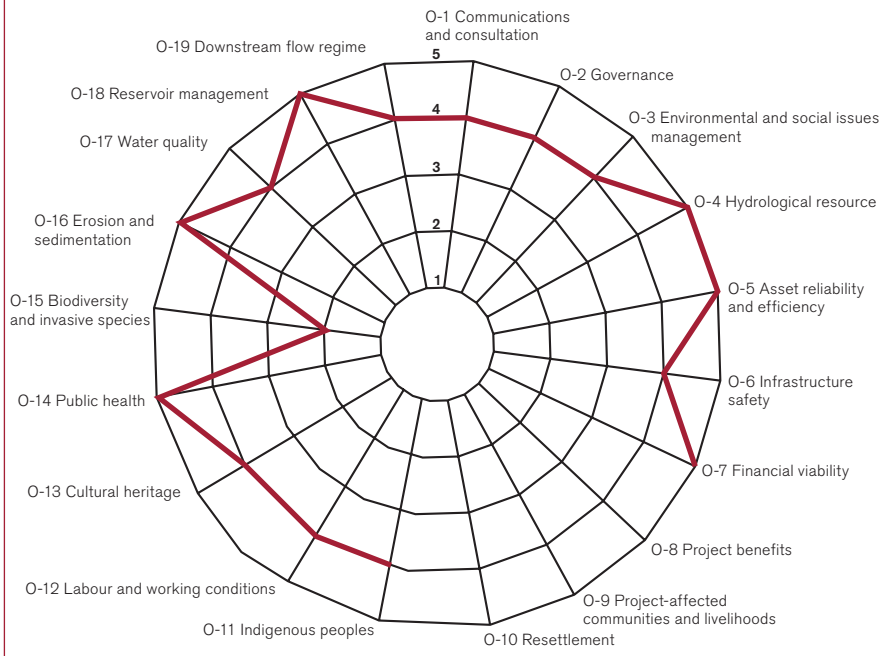
Source: HSAP (2014b). Protocol assessments. HSAP website.
See http://www.hydrosustainability.org/Protocol-Assessments.aspx.

Figure 9. Spider diagram for HSAP assessment of Hvammur hydropower project (preparation stage)



Source: HSAP (2014b).

Figure 10. Spider diagram for HSAP assessment of Trevallyn, Tasmania (operation stage)



Source: HSAP (2014b).

As more assessments are published, there will be opportunities for comparison within and across countries, regions or hydropower types, building up a clearer picture of where good practice is or is not being met in different circumstances. The assessments made so far are available for comment on the web, and it also remains to be seen whether these HSAP assessments are perceived as independent and transparent and receive buy-in from all local stakeholders.

The World Wide Fund for Nature has said, '[t]he Hydropower Sustainability Assessment Protocol (HSAP) is making operational (the) WCD recommendations and is a useful assessment tool which is mainly designed for developers, to measure and guide the hydropower sector's performance in matters of sustainability' (WWF, 2013, p. 13).

This review agrees that the HSAP offers a sharper tool than the WCD for assessing *individual* project performance on a range of scored indicators. While it does not cover identical ground to the WCD, it encompasses many of the key elements relevant to an individual dam project with the distinct advantage of making them measurable, which the WCD does not. In this regard the HSAP represents the best currently available measuring stick for respect for WCD provisions in individual projects.

Safeguard policies of the multilateral system and investment banking

Chapter 2 showed that only a relatively limited proportion of current dam projects are covered by safeguard policies and guidelines linked to the various international funding streams. However, these policies do represent an important source of global good practice. They refer to all kinds of investment projects and are not necessarily dam specific. The following sections give some background information and insights into existing policies and the degree to which various actors (including the banks themselves and some NGOs) consider that they coincide with the WCD recommendations.

This review has undertaken no independent assessment of safeguard compliance or the effectiveness of such policies in terms of improving outcomes. It is clear from the published material available that a fully objective global assessment of the effectiveness of the safeguard policies is still well out of reach. Both pro- and anti-dam activists and organisations offer evidence to support their case while accusing others of selective bias. In that sense, little has changed since the WCD. Some examples given below illustrate where the fault lines remain.

5.1 Multilateral banks

All of the multilateral development banks (MDBs) have internal safeguard policies that apply to all projects, including large dams. Typically, an initial screening process establishes the level of risk of uncertain environmental and social outcomes that triggers the application of some or all of the operational safeguard policies.

The policies may differ in wording slightly between the MDBs, but the broad principles remain very similar. Table 7 shows which of the major MDBs have safeguard policies in particular subject areas. Box 6 indicates how the African Development Bank (AfDB) is modifying its internal safeguard system to establish a more comprehensive and harmonised approach. This process has been through regional consultation stages but appears not yet to have been completed.

Many hydropower and large dam projects have multiple donors.[37] Where the World Bank is involved it is usually as project leader, and their policies and approaches tend to dominate. In addition, private investments are generally linked to the World Bank safeguards when the IFC is involved. This section therefore concentrates on the World Bank safeguards.

At the time the WCD was published (2000), preliminary comparisons of the WCD recommendations and current bank policies (Table 8) showed that:[38]

- There are no major differences between the WCD recommendations and the bank's operational policies on environmental assessment, natural habitats, cultural resources and the safety of dams.

37. For example the Kandadji Dam in Niger has nine donors and the Lom Pangar dam in Cameroon five or more (World Bank, undated; International Rivers, 2014b).
38. Reaction to the WCD was initially posted on the WCD website (http://dams.org) and later captured on the UNEP website (UNEP, 2014).

- Significant differences exist over policies for resettlement and dealing with indigenous peoples, mainly due to the concept of free, prior and informed consent that could be interpreted as a veto right.
- On resettlement, the WCD's requirements for demonstrable public acceptance and negotiated agreements represented a higher standard than current bank policies.

On this basis, the bank decided to use the WCD as a reference, but not to apply all its criteria and guidelines. A sample of terms of reference (ToRs) for environmental and social impact assessments (ESIA) for a number of recent projects (e.g. Kandadji Dam; AfDB, 2004) found that the WCD is cited as a reference to be taken into consideration, but without a requirement to apply all its provisions.

Table 7. Coverage of risk areas by MDB safeguards

	World Bank	IFC	ADB	EBRD[1]	EIB[2]	IADB	MFI-WGE[3]
ESA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Involuntary resettlement	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pollution prevention	Yes	Yes	(in ESA)	Yes	Yes	Yes	Yes
Biodiversity	Yes	Yes	(in ESA)	Yes	Yes	Yes	Yes
Community impacts	No	Yes	(in ESA)	Yes	Yes	No	Yes
Labour conditions	No	Yes	(in ESA)	Yes	Yes	No	Yes
Indigenous people	Yes	Yes	Yes	Yes	Yes	Yes	No
Cultural heritage	Yes	Yes	(in ESA)	Yes	Yes	Yes	Yes
Environmental flows	Yes	No	No	No	No	No	No

Notes: 1 European Bank for Reconstruction and Development; 2 European Investment Bank; 3 Multilateral Financing Institutions Working Group on the Environment, a working group that shares approaches and experience on applying safeguards to the environment (AfDB, 2012).

Table 8. Comparison of World Bank and WCD topics

World Bank environmental and social safeguard policies[39] Consists of 10 policy objectives and 65 operational principles	**WCD strategic priorities** Consists of 7 strategic priorities and 34 policy principles
1. Environmental assessment (overarching) (11) 2. Natural habitats (7) 3. Pest management (5) 4. Involuntary resettlement (12) 5. Indigenous peoples (9) 6. Forests (10) 7. Physical cultural resources (PCR) (5) 8. Safety of dams (6) 9. Projects on international waterways 10. Projects in disputed areas	1. Gaining public acceptance (4) 2. Comprehensive options assessment (5) 3. Addressing existing dams (5) 4. Sustaining rivers and livelihoods (5) 5. Recognising entitlements and sharing benefits (4) 6. Ensuring compliance (5) 7. Sharing rivers for peace, development and security (5)

39. Note the number in brackets indicates the number of operational policies and policy principles; see World Bank (2014).

Box 6. African Development Bank operational guidelines under review

The African Development Bank has reviewed its internal safeguard policies and embarked on a process of establishing an integrated safeguard system (ISS). The following is an extract from the ISS Draft Options report (AfDB, 2012).

'The Bank has concluded that this portfolio of policies is unsuitable as the basis of an integrated and effective set of environmental and social safeguards. Its analysis of recent experience in applying these policies finds the following problems: i) high transaction costs within the Bank and among its clients, attributable to time and effort required to consider diverse sources of policy; ii) the dilution of important subjects because of the uneven coverage of relevant issues addressed in different policies; iii) hindrances in implementation because of conflicting priorities and potential conflicts between policies; and iv) difficulties in monitoring the compliance of borrowers and the Bank itself.

In the ISS concept note, the Bank concludes that the existing policy portfolio lacks a clear, integrated set of operational environmental and social requirements that can be easily understood by borrowers, Bank officials and external observers.

The need for an ISS is also based upon trends and best practice among MDBs and other Development Financing Institutions (DFIs). Following the Paris Declaration, there has been a greater impetus to harmonize environmental and social safeguards among development agencies. In addition, the MDBs have established a Multilateral Financial Institutions Working Group on the Environment, in which the Bank is an active participant. In 2005, this Working Group published a Common Framework for Environmental Assessment in an attempt to encourage greater harmonization of environmental and social safeguards among its members.

In the past few years, almost all the MDBs have completed or have embarked on major revision and upgrading of their set of environmental and social policies, safeguard requirements and standards. This process has greatly increased the compatibility of MDB environmental and social safeguards, in terms of coverage, specific requirements and procedural steps. This is highly significant for the Banks' co-financing with other MDBs.

The International Finance Corporation adopted its Performance Standards on Environmental and Social Sustainability in 2006 and revised them in 2011. Since 2006, the Inter-American Development Bank, European Bank for Reconstruction and Development, European Investment Bank and Asian Development Bank have all upgraded their safeguard systems. The World Bank and the Islamic Development Bank are now upgrading their systems; and the Bank has agreed to co-operate with both in this process'.

The World Bank's safeguard policies are currently being reviewed. Over the years a number of analyses of these safeguards and their differences with the WCD have been undertaken. These necessarily come from different perspectives and most of the analytical energy has come from the NGO sector. Box 7 gives an example of one comparison done by the NGO sector, in this case the International Rivers Network (IRN), and other views are available.[40] An overview of the World Bank's safeguard approaches is given in Annex 3.

40. See for example Hildyard (2005) and former WCD Commissioner Ted Scudder's communication with the OECD, which argues that downstream impacts are missed by, or are deficient in, the World Bank's safeguards and are the crucial difference between the WCD approach to involuntary resettlement and the World Bank's (Scudder, 2005).

Box 7. Assessing the World Bank safeguards: International Rivers Network

The NGO International Rivers Network (IRN), which has long campaigned against the social and environmental impacts of large dams, reviewed the existing World Bank safeguards in 2008 and concluded:

- Only the WCD requires the free, prior and informed consent of affected indigenous peoples, as well as the provision of legal support for and the negotiation of agreements with affected people.
- Only the WCD requires a comprehensive, participatory assessment of development needs and options to meet those needs – where environmental and social concerns are given the same significance as other factors – before decisions are taken to proceed with a particular water or energy project.
- Only the WCD requires that dams have time-bound license periods and that issues – including all outstanding social problems – from existing dams are identified and addressed.
- Only the WCD requires a basin-wide approach to decision making on water and energy projects, including prioritising developments on tributaries, ensuring a net gain for species, and releasing environmental flows.
- Only the WCD requires legally enforceable agreements with affected people covering both mitigation measures and benefit sharing arrangements, and that adversely affected people in all project areas are the first to benefit.
- Only the WCD requires a clear compliance framework that includes both sanctions and incentives with necessary costs built into the project budget, as well as calls for pro-active anti-corruption measures.
- Only the WCD requires negotiations amongst riparian states before the construction of a dam on a shared river.

Source: International Rivers Network (2008a).

5.2 World Bank safeguard coherence with the WCD

The view taken in this review on the degree of coherence between the World Bank safeguard policies and the WCD is the following:

1. There is only limited one-to-one mapping of the 65 operating principles underpinning each of the 10 World Bank safeguard policies and the 34 policy principles underpinning the 7 WCD strategic priorities (see Table 8). This prevents effective detailed comparison.
2. There are many varied, often polarised interpretations of the coherence between the WCD and the World Bank safeguards. In some cases it is a matter of emphasis, in others there is no common ground on how (i.e. with what 'tool') to meet the WCD aspiration. The 'how' is contested perhaps as much as the 'what'. For example, participatory river basin and energy planning may be acceptable to many, but how do you achieve that in countries with weak institutions and capacity? Disconnects on terminology do not help provide a common language: for example, the WCD calls for a 'full options assessment', the World Bank considers that assessing 'project alternatives...moving options assessment upstream in the process' meets this aim.

3. It is clear that the approaches of the World Bank and the WCD to involuntary resettlement differ. The WCD's policies require that resettlement plans be implemented to improve the living standards of those resettled while the World Bank states that improvement is only the most desirable outcome, and allows national governments and project authorities to restore incomes and living standards.
4. The WCD broadly goes further in all aspects of sustaining rivers and livelihoods than the World Bank does, and calls for water disputes to be arbitrated by international courts.
5. The WCD lies much further towards the 'negotiation' end of the information-consultation-participation-negotiation spectrum than the World Bank and takes a stronger rights and risks approach (WCD Chapter 7) , whereas the World Bank relies on existing national decision-making legislation and processes.

The areas where they are in greater harmony are not so contested. They include aspects of a more technical orientation such as the safety of dams and the need to consider existing dams from a sustainability perspective.

It is clear also that the World Bank safeguards are not static. Over the years since the WCD reported, the World Bank has regularly revised its safeguards, most notably in 2006 for involuntary resettlement. A number of themes recommended by the WCD have been adopted by the World Bank's broader operational guidance but have not been translated to safeguards as such. These include:

1. Environmental flows[41] incorporated in the water resources strategy (2003) (World Bank, 2004)
2. Approaches to benefit sharing with local affected people (2011 and ongoing).
3. Assessment of net greenhouse gas emissions from dams: recent guidance to include GHG emission estimates in EIAs for hydropower and other dam projects supported by the World Bank (Liden, 2013).

The World Bank requires that a review of the impacts of safeguards and sustainability policies are provided in the project appraisal documents that staff submit for consideration of hydropower and dam projects by the World Bank Board. Independent observers feel the bank does not have a clear framework to fully assess the impacts of its safeguards and sustainability policies, or the framework is inadequate (IEG, 2010).

5.3 The Equator Principles

Private banks are increasingly interested in funding large-scale hydropower projects. Beyond respecting national legislation, the only additional safeguards for private banks lie in the Equator Principles (EPs), established in 2006 between private banks and the IFC (Box 8; Equator Principles, 2006). They emerged primarily in response to the recognition that many projects received project

41. See for example World Bank (2004).

Box 8. The Equator Principles

Equator Principle Financial Institutions will only provide loans to projects that conform to Principles 1-9 below:
Principle 1: Review and categorisation
Principle 2: Social and environmental assessment
Principle 3: Applicable social and environmental standards
Principle 4: Action plan and management system
Principle 5: Consultation and disclosure
Principle 6: Grievance mechanism
Principle 7: Independent review
Principle 8: Covenants
Principle 9: Independent monitoring and reporting
Principle 10: Equator Principle Financial Institutions' reporting

Source: Equator Principles (2006).

finance from international commercial banks where there was no requirement for environment and social standards apart from national standards. Private sector banks had growing concerns over reputational risk and others were concerned about the perceived lack of operational clarity of the World Bank safeguards for private sector projects.

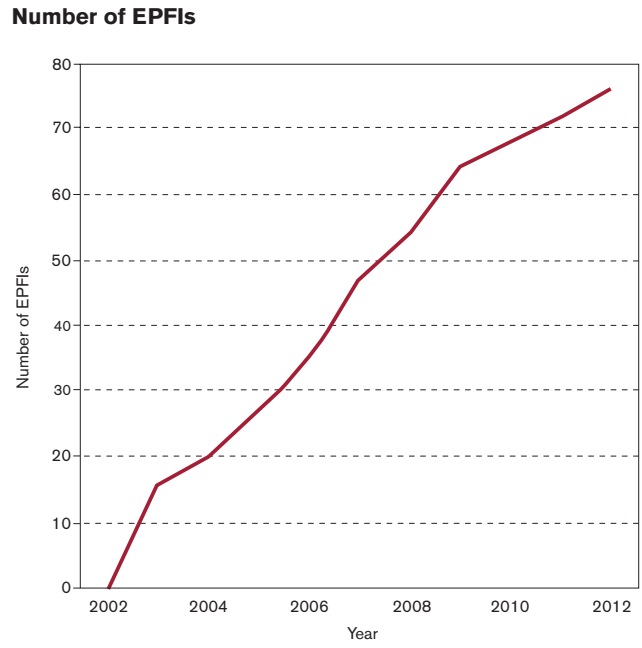
The principles emerged primarily in response to the perceived inadequacy of the World Bank safeguards to provide sufficient clarity and utility for private sector projects. According to the Equator Principles website, 'The Equator Principles (EPs) is a credit risk management framework for determining, assessing and managing environmental and social risk in Project Finance transactions' (Equator Principles, 2014b). Project finance is used to fund the development and construction of major infrastructure and industrial projects. It looks to secure loans against the project cash flow, after commissioning, rather than the credit worthiness of the borrower. The EPs are adopted by financial institutions and are applied where project capital costs exceed US$10 million. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision making.

The EPs are based on the IFC's Performance Standards on Social and Environmental Sustainability (IFC, 2006) and on the World Bank Group EHS Guidelines (IFC, 2007).

The number of Equator Principles Financial Institutions (EPFIs) has grown consistently since 2002 (Figure 11). They commit to not providing loans to projects where the borrower will not, or is unable, to comply with their respective social and environmental policies and procedures.

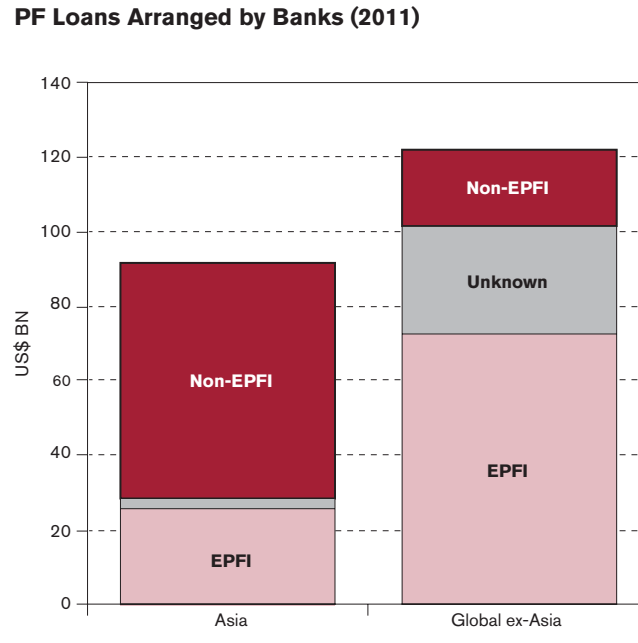
In addition, while the EPs are not intended to be applied retroactively, EPFIs apply them to all project finance transactions to expand or upgrade an existing facility where changes in scale or scope may create significant environmental and/or social impacts, or significantly change the nature or degree of an existing impact.

Figure 11. Number of EPFIs



Source: Project Finance (2011).

Figure 12. Value of EPFI loans



Source: Project Finance (2011).

The principles have become the finance industry standard for environmental and social risk management. Financial institutions, clients/project sponsors, other financial institutions and even some industry bodies refer to them as good practice.

The EPs have greatly increased the attention and focus on social/community standards and responsibility, including robust standards for indigenous peoples, labour standards, and consultation with locally affected communities within the project finance market. They have also promoted convergence around common environmental and social standards.

In 2011, EPFIs accounted for about 60 per cent of the global project finance bank market by volume of loans arranged (US$213 billion), but only 25 per cent in Asia where only four banks are EP members (Figure 12).

In 2012, IFC completed a two-year process of updating the safeguards, in consultation with the EPFIs, and new and extensive guidance was published on 1 January 2012 (IFC, 2012). During that process, there were conflicting views over the issues of carbon dioxide (CO_2) emissions from coal fired power stations, human rights and biodiversity. The revised guidance sets the bar higher than previously, and includes extensive guidance notes to help investors on particularly sensitive topics. Since their adoption there is little evidence of a notable decline in the IFC or EPFI funding portfolios that might indicate that the bar has been set too high. The structural scarcity of EPFIs in Asia is however notable.

The Equator Principles link specifically to the IFC Performance Standard safeguard strategies (IFC, 2006). As with the WCD and IHA, there is not complete coherence between the sets of WB and IFC safeguards and performance standards, which makes it challenging to compare them. They do however cover broadly similar ground (see Table 9).

The updated IFC Performance Standard (IFC, 2012) has taken several steps to better codify what consultation and engagement means, even though the wording falls short of the WCD expectations on negotiation. It proposes consultations should:

1. begin early in the process of identification of environmental and social risks and impacts and continue on an ongoing basis as risks and impacts arise
2. be based on the prior disclosure and dissemination of relevant, transparent, objective, meaningful and easily accessible information which is in a culturally appropriate local language(s) and format and is understandable to affected communities
3. focus inclusive engagement on those directly affected as opposed to those not directly affected
4. be free of external manipulation, interference, coercion, or intimidation
5. enable meaningful participation, where applicable
6. be documented.

Table 9. Comparison of IFC and World Bank safeguards

	World Bank Safeguard Operational Policies	IFC/MIGA Policy and Performance Standards on Social and Environmental Sustainability (2006/2007)
Environmental and Social		PS 1: Social and Environmental Assessment and Management System
Environmental	4.01 Environmental Assessment (1999) 4.04 Natural Habitats (2001) 4.36 Forests (2002) 4.09 Pest Management (1998) 4.11 Physical Cultural Resources (2006) 4.37 Safety of Dams (2001)	PS 6: Biodiversity Conservation and Sustainable Natural Resource Management PS 3: Pollution Prevention and Abatement PS 8 : Cultural Heritage
Social	4.12 Involuntary Resettlement (2001) 4.10 Indigenous Peoples (2005)	PS 5: Land Acquisition and Involuntary Resettlement PS 7: Indigenous Peoples PS 2: Labour and Working Conditions PS 4: Community Health, Safety and Security
Legal	7.50 International Waterways (2001) 7.60 Disputed Areas (2001)	

Source: IEG (2010).

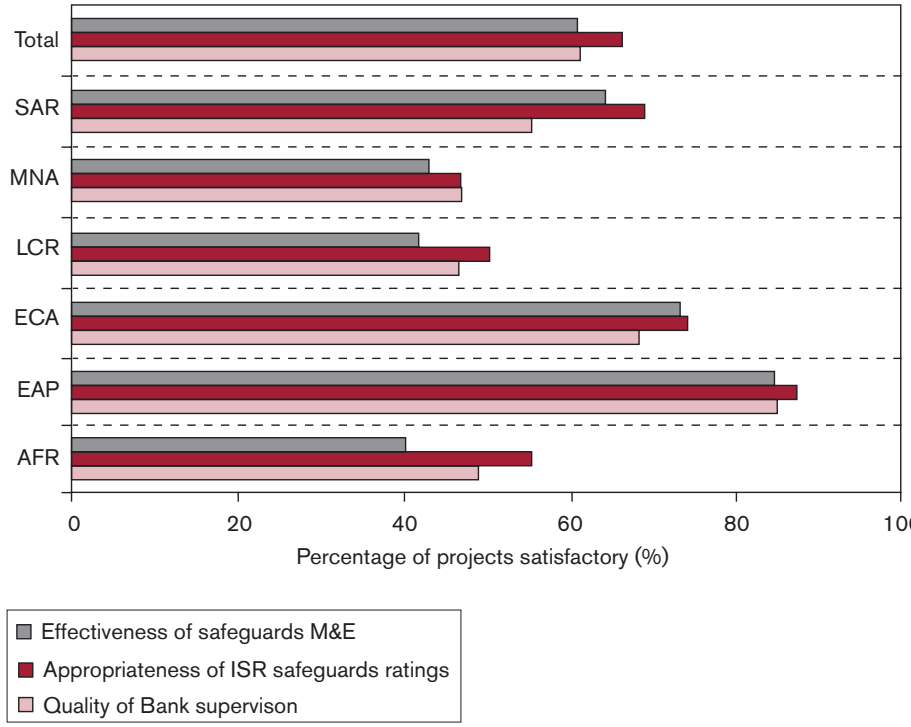
The complete text (see Annex 6) articulates what 'engagement' means in this context and goes further than the information and consultation approach favoured by the World Bank.

5.4 From safeguards to implementation

Defining safeguards is only one part of ensuring sustainable outcomes; the capacity to deliver is equally critical. It is not really the purpose of this review to ask whether safeguards are indeed being applied, however the capacity to implement them forms part of the equation in trying to assess whether the bar is set too high for effective delivery.

As the MFIs control the budgetary and project design processes, it is easier to obtain information for these institutions than, for example whether Clean Development Mechanism projects have indeed respected the WCD as the latter has many fewer monitoring and evaluation (M&E) processes in place. A recent review by the Independent Evaluation Group (IEG) of the World Bank Group (IEG, 2010) found 60 per cent of all projects (not just dams) to be satisfactory or better (see Figure 13) and only 40 per cent in Africa. This may suggest that bank clients and staff may already be struggling to deliver the existing safeguards effectively and the bar is already quite high.

Figure 13. Supervision of safeguards in World Bank-financed projects by region



Note: Satisfactory refers to ratings of *satisfactory* or *excellent* from the portfolio review by IEG reviewers

Source: IEG (2009).

The precise application of the Equator Principles by individual banks varies as there are more than 75 institutions involved and no specific implementation framework. Limited reporting is required, but there is no independent verification system. While this has led to speculation that some banks may be seeking primarily a 'greenwash' effect, there are few alternative approaches on the table at present.

The EU Linking Directive compliance system is also incomplete in that the directive requires respect of WCD criteria and guidelines during planning, but there is no reporting or independent verification, and the process is 'self assessed' on application. NGOs who have reviewed some of the projects on the ground have been critical of outcomes in the field (see Chapter 7).

6

Sustainable hydropower opportunities in a low-carbon strategy

This chapter reviews some of the issues around targeting support for hydropower as part of a sustainable development and low-carbon strategy. It also covers the challenges in harmonising environmental and social assessments on dam projects.

Policy in this area has been driven by two main concerns. The first is to ensure that international financial support for greenhouse gas mitigation is targeted on technologies that demonstrably reduce emissions. The second is to screen out projects with potentially damaging social and environmental impacts. The inclusion of the WCD and the HSAP in the EU Linking Directive (EU, 2004), and the OECD 'common approaches' (OECD, 2012) can be seen as part of the latter strategy. In addition, however, some policy makers have also been swayed by the argument that 'small' hydropower has fewer impacts than 'large' hydropower, and this has led to the EU adopting a 20 megawatt limit (EU, 2004) above which additional safeguards kick in. This section reviews some of the evidence for these policies as well as some of the observable outcomes.

6.1 Hydropower greenhouse gas emissions – gross and net

Reservoirs, like all natural wetlands, emit greenhouse gases (GHGs) to some extent and there has been considerable, often polarised, debate and scientific exchanges addressing the reservoir/GHG emission nexus. The WCD (2000) helped bring attention to the debate.

Broadly, the larger the reservoir area required to generate power, the higher the reservoir emissions and the greater the possibility that reservoir emissions may exceed the thermal generation offset. Dams with low installed capacity but large reservoir areas are therefore most at risk.

The approach adopted by the CDM Executive Board was to set thresholds in terms of power density (installed capacity in megawatts divided by the flooded surface area), which determine the eligibility of hydropower plants for the Clean Development Mechanism. The thresholds were defined by the United Nation Framework Convention on Climate Change (UNFCCC) Methodology Panel in 2006 as follows (CDM, 2006):

1. Hydroelectric power plants with power densities less than or equal to 4 watts per square metre (W/m^2) cannot use current methodologies which means carbon financing will not be given for the project.
2. Hydroelectric power plants with power densities greater than 4 W/m^2 but less than or equal to 10 W/m^2 can use the currently approved CDM methodologies, with an emission factor of 90 grams of CO_2 equivalent per kWh – meaning they could still be eligible, but require more evaluation and potentially get less support.

3. Hydroelectric power plants with power densities greater than 10 W/m^2 can use current approved methodologies for calculating thermal emissions avoided and the project emissions from the reservoir may be neglected – meaning that, all things considered, the project should be eligible for carbon financing.

Projects under 4 W/m^2 might still be able to sell carbon credits on the open market for verified emission reductions (VERs) but they attract a much lower price. This threshold has had the effect of selecting mainly run-of river (ROR) projects; over 72 per cent of the CDM-certified hydropower emission reduction credits had been allocated to ROR by the end of 2012 (Table 10).

Table 10. Proportion of run-of-river schemes in CDM-supported hydropower projects

	Number	%
Run-of-river	1649	72.3
Existing dam	109	4.8
Higher efficiency hydro (retrofit)	5	0.2
New dams	519	22.8
Total number of hydropower projects	**2281**	**100.0**

Source: UNEP Risoe (2014).

The CDM methodologies to calculate the thermal avoided emissions that hydropower generates are clear. The CO_2 equivalent calculations are relatively straightforward.

The World Bank recently released interim guidance to its staff on how to assess GHGs from reservoirs in preparation for dam infrastructure projects (Water Policy and Practice, 2013). The report (Liden, 2013) makes recommendations on how to assess GHG emissions and preliminary estimates of emissions caused by biochemical processes for planned reservoirs. It emphasises the river basin perspective and notes changes in GHG fluxes to the atmosphere because the introduction of reservoirs into a river system must be viewed from a catchment perspective. Net GHG emissions created by the reservoir are the difference between total fluxes for the whole river basin before and after the reservoir is constructed. This is a good example of a WCD recommendation that has been further studied, analysed and built on over 13 years to develop a methodology able to deliver the specific WCD recommendation to measure the net GHGs avoided, not the gross.

Liden (2013) recommends studying biochemically generated GHGs from the reservoirs as part of the environmental impact assessment for all World Bank-supported hydropower projects.[42] This would enable the comparison of alternative design options within the framework of the investment project.

42. Or dam infrastructure projects with significant inundation for which the World Bank may provide financing.

6.2 Hydropower and carbon financing

The CDM's watts per metre threshold, which was developed to focus on non-controversial hydropower projects (i.e. those with limited reservoir areas and therefore reduced potential for reservoir GHG emissions) has had the effect of directing CDM support towards run-of-river hydropower with small reservoirs.

Data on hydropower in CDM compliance markets indicate hydroelectric schemes have been one of the most successful project types in the carbon market to date, which is largely down to the Clean Development Mechanism. China accounts for 70 per cent of hydropower projects above 15 megawatts in the CDM.[43]

There are well documented rival visions of CDM additionality, namely, the environmentally-based and project-based versions, which affect whether a project is deemed to be eligible for CDM carbon support.[44] Some new issues are emerging, such as whether hydropower carbon credits should be owned by the project, country or region – for example, project concession agreements might assign existing or future credits to a national or regional fund.[45]

Tables 11 and 12 offer summary data on the status of hydropower in the CDM, which reports hydropower under the four categories noted in Table 10 (run-of-river, existing dams, high efficiency hydropower (retrofit) and new dams). Table 11 divides hydropower schemes into large (over 15 megawatts) and small (under 15 megawatts). Large projects represented about 86 per cent of expected CERs for all hydropower in the CDM system and the average project size in the large hydropower category was 189 megawatts.[46] The industry's experience under the CDM is that carbon financing typically added about 5-6 per cent to the revenue stream of hydropower projects and increased the expected internal rate of return (IRR) by around 2-3 per cent (Webb, 2008).

Table 11 further shows that Asia accounts for 87 per cent of CDM financing for hydropower, followed by Latin America (14.8 per cent), and Africa and the Middle East (0.6 per cent). Table 12 also shows wind power now has more project applications in the CDM system than hydropower, though hydropower accounts for the largest number of CERs per year (27 per cent compared to 19 per cent for

43. As of early 2013, 2470 hydro projects with an installed capacity of 244,635 megawatts were registered or seeking registration with the CDM (International Rivers, 2013; UNEP Risoe, 2014). Of these projects, 1606 (73,387 megawatts) are in China. Of the 1239 (233,869 megawatts) large projects (those above 15 megawatts in capacity according to the CDM definition), 862 (70 per cent) are in China. A total of 131.62 million certified emission reduction credits (CERs) have so far been issued across 643 projects.
44. In the former interpretation, a project is additional if the GHG emissions afforded by the scheme are lower than the general baseline without the project. In the latter, which is sometimes termed 'project additionality', the scheme would not have happened without numerous barrier checks and CDM validation, which is the common approach.
45. This has implications for how national and regional environment and social criteria are allied and the possibility to extend the influence of the WCD and the HSAP.
46. The largest hydropower project registered under the CDM was 240 megawatts in the Gansu section of the Yellow River (2008).

wind). Together hydropower and wind account for close to half of all CERs (of all types) issued under the CDM (China also became the world's largest wind energy market by new installed capacity in 2012).[47]

Table 11. Hydropower (CDM) database showing status by region

			No.	Capacity (megawatts)	Expected CERS (x1000)/yr	CERS issued (x1000)
Total no. of active projects			2476	244711	381888	145760
Total large-scale projects (>15 megawatts)			1240	233904	329886	124479
Total small-scale projects (≤15 megawatts)			1237	10807	51501	21281
By region:	Large scale	Small scale				
Africa and Middle East	10	13	23	2214	8085	0
Asia Pacific	1096	1134	2230	101240	297834	129088
Europe	11	18	29	2704	3597	1
Latin America	200	167	367	146627	72371	16671

Large-scale hydros by stage

	Africa and Middle East	Asia Pacific	Europe	Latin America	Total
At validation	5	235	7	100	347
Required registration	0	11	0	1	12
Registered	3	793	1	80	877
Under review or correction	0	0	0	0	0
Rejected or withdrawn	0	11	2	5	18

Source: International Rivers (2013). Last updated 26 March 2013.

47. 'China is the largest hydropower market. China also became the world's largest wind market in 2012 in terms of annual installed capacity, according to figures compiled by Bloomberg New Energy Finance. The country installed 15.9GW of onshore turbines, or more than one-third of all new capacity worldwide. 2012 was the fourth successive year China led the field since overtaking the US in 2009. The US, which had record installations of 13.2GW last year, still installed 14 per cent fewer turbines than China.' (Bloomberg New Energy Finance, 2013).

Table 12. CDM status by project type (to end of 2012)

Type	CDM							
	number		CERs/yr(000)		2012 CERs (000)		CERs Issued (000)	
Wind	2611	30%	239043	19%	285497	12%	141647	10%
Hydro	2281	26%	337639	27%	363696	15%	179779	13%
Biomass energy	823	9%	56300	5%	130532	6%	39835	3%
Methane avoidance	727	8%	30976	3%	82312	3%	19121	1%
Landfill gas	417	5%	61119	5%	179368	8%	51292	4%
EE own generation	416	5%	53860	4%	153031	6%	66637	5%
Solar	413	4.7%	13881	1.1%	4352	0.2%	1023	0.07%
EE Industry	144	1.6%	5772	0%	11792	1%	2840	0.2%
Fossil fuel switch	141	1.6%	73496	6%	138204	6%	49302	3%
EE Supply side (power plants)	118	1.3%	57782	5%	33053	1%	3117	0.2%
N2O	108	1.2%	57634	5%	249917	11%	267802	19%
Coal bed/mine methane	106	1.2%	68776	6%	90902	4%	30843	2.2%
EE Households	103	1.2%	3891	0.3%	3444	0.1%	399	0%
Afforestation and reforestation	66	0.8%	4732	0.4%	20097	0.9%	10757	1%
Fugitive	58	0.7%	46352	4%	73420	3%	21151	1.5%
EE Service	39	0.4%	1915	0.16%	496	0.02%	9	0%
Transport	37	0.4%	5060	0.4%	6168	0.3%	1141	0.1%
Geothermal	35	0.4%	12401	1%	12957	1%	7193	0.5%
Cement	29	0.3%	4968	0%	22240	1%	3024	0.2%
Energy distrib.	28	0.3%	10267	1%	8339	0%	1501	0%
HFCs	23	0.3%	81334	7%	473654	20%	516006	36%
PFCs and SF6	18	0.2%	5540	0%	11455	0.5%	4481	0.3%
Mixed renewables	10	0.11%	554	0%	116	0%	16	0%
CO_2 usage	3	0.03%	80	0%	155	0.01%	10	0.001%
Tidal	1	0.01%	315	0%	474	0.02%	433	0%
Agriculture	2	0.02%	58	0%	25	0%		
Total	**8757**	**100%**	**1233737**	**100%**	**2355697**	**100%**	**1419359**	**100%**
HFCs, PFCs, SF6 and N20 reduction	149	1.7%	144508	12%	735027	31%	788289	56%
Renewables	6174	71%	660124	54%	797624	34%	369926	26%
CH4 reduction and cement and coal mine/bed	1342	15%	212329	17%	448422	19%	125440	8.8%
Supply-side EE	562	6%	121910	10%	194423	8%	71255	5%
Fuel switch	141	1.6%	73496	6%	138204	5.9%	49302	3.5%
Demand-side EE	286	3.3%	11578	0.9%	15732	0.7%	3248	0.2%
Afforestation and reforestation	66	0.8%	4732	0.4%	20097	0.9%	10757	1%
Transport	37	0.4%	5060	0.4%	6168	0.3%	1141	0.08%

Source: UNEP Risoe (2014).

The European Union Emissions Trading System (EU ETS) is now the largest trading scheme in the world. As noted in Chapter 2, international credits are available under the EU ETS for emission-reducing projects in the 48 least-developed countries (LDCs), which is more restrictive than the CDM.[48] In particular this excluded the BRICS counties. China and Brazil are now establishing their own pilot carbon markets and trading systems and South Africa is reportedly introducing carbon tax schemes from 2015 (see Section 2.2). The BRICS carbon trading initiatives may be of future interest to the European Trading Scheme in respect to international partnerships to exchange lessons, potentially including issues related to dam safeguards.

Do environmental and social standards impact on the ability of hydropower to access the EU ETS? The International Hydropower Association took the view in its 2010 Activity Review (IHA, 2010a) that there were constraints, but this was not so much because of the standards themselves (i.e. how high the bar was set), but more in relation to uncertainty and confusion on how to implement them. In this sense, the lack of clear guidance affected carbon opportunities.[49]

The 2012 OECD Council recommendation to link ECA consideration of support for hydropower from ECAs to the WCD and HSAP protocols may have partly resolved this situation. Any remaining differences in interpretation between the EU Linking Directive and OECD Council recommendation would need to be resolved, however.

6.3 Do run-of-river schemes offer reduced impacts?

There are many types of hydropower projects ranging from small to large. They include run-of-river projects, water storage projects that feature hydropower and the rehabilitation of existing projects. But there are also pumped storage and multipurpose projects. This section looks at whether ROR schemes have lower environmental and social impacts that justify prioritising them over storage schemes as part of a broader policy of impact reduction.

Run-of-river

Run-of-river schemes are hydropower projects of various scales that have no seasonal flow regulation. With the exception of a limited amount of pondage, the output of a run-of-river scheme is essentially dependent on the timing and size of river flows. There are three main sub-types of ROR hydropower schemes:

48. There is also debate on access to EU-CTS as revealed in consultations. For example, the Project Developer Forum (PDF) argues that restrictions in Phase III of the EU-CTS (2013-2020) that exclude non-LDC developing countries is a significant issue, as most developing countries are excluded from participation (Project Developer Forum, 2012).

49. The European Union's ETS Directive requires member states to ensure that hydro projects (above 20 megawatts) meet 'relevant international [sustainability] criteria'. Differences in application of this obligation resulted in an unwillingness on the part of carbon exchanges to accept such credits. To address this issue and ensure that CERs from hydro were eligible across the EU, the European Commission has issued a harmonised guidance for developers. This has contributed to improving uniformity and market confidence in the sector. The Hydropower Sustainability Assessment Protocol (currently under a cross sector review, and building on a previous version produced by IHA) may provide an even more robust tool. The IHA and HSAF expects that its development will be an important step in achieving a generally accepted matrix within which to assess hydro projects (IHA, 2014).

1. Pure run-of-river: schemes without any flow regulation at all, where the water is turbined as it comes.
2. Pondage run-of-river: schemes where water is released to maximise generation during the electricity peak demand hours, which requires some storage behind a dam to provide the daily and/or weekly regulation.
3. Diversion run-of-river: schemes where a portion of the river is diverted by intakes upstream of the dam to surface or underground tunnels that run to a powerhouse downstream, with the water returned to the river at that point. The diversion may be anything from a few hundred meters to tens of kilometres and is often around a river bend with a significant gradient.

Over the past decades, many countries have made considerable changes to the maximum permissible amount of water that may be diverted in a river system where it impacts on downstream uses and water status. A diversion run-of-river project may also divert the water to another river basin which would affect the seasonal stream flow pattern in both the downstream and the recipient river, and introduce issues of water quality exchanges between catchment.

Storage hydropower

Storage hydropower schemes have a dam and a storage reservoir for monthly, seasonal or even longer regulation; some schemes have carry-over storage that can regulate water over a period of several years. These schemes affect the stream flow pattern of the downstream river. Water is released as power is dispatched to the electricity grid to optimise generation across the system. A storage project may also divert the water to another basin with consequent impacts. Storage projects are often multipurpose, for example combining hydropower, irrigation and flood control. A downstream re-regulating weir may be needed to damp out the adverse effects of variable releases into the river that cause pulses of water-level peaks.

Rehabilitation projects

Rehabilitation projects might be to upgrade, refurbish or change operations at existing facilities, which can be run-of-river or storage projects. The rehabilitation of existing hydropower plants has been a major focus of activities in the USA and Europe, and is increasingly important worldwide as dams age.[50]

Pumped storage

Pumped storage hydropower schemes have an upper and a lower storage reservoir for daily or weekly regulation. During low-cost off-peak hours, the station pumps water from the lower to the upper reservoir. This stored water then drives turbines during peak hours, offsetting thermal generation. Some pumped storage schemes are new, others are retrofitted onto an existing reservoir, such as the 500 megawatt Lam Ta Khong pumped storage retrofit in 2002 on a 30-year-old irrigation reservoir (MRC, 2005).

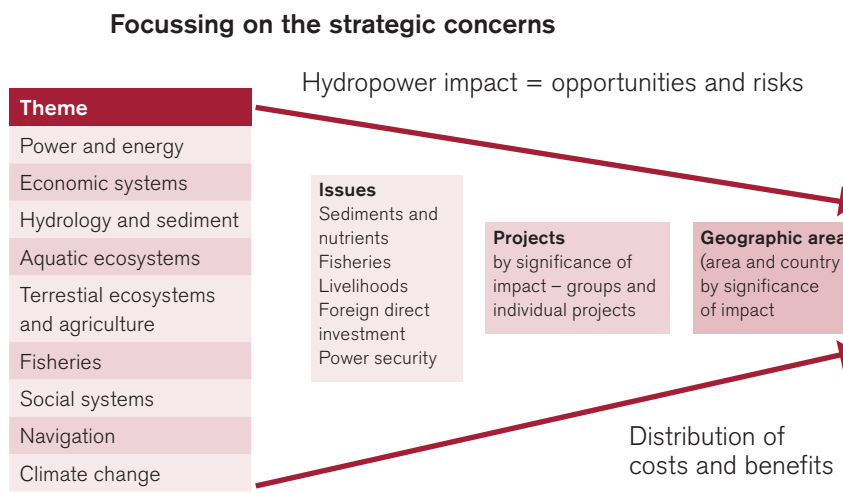
50. This work should focus on assuring the safety of the existing dam structures as well as rehabilitating/upgrading the electromechanical and instruments and control components. In addition, experience is also pointing to the need to combine this work with addressing any outstanding environmental problems associated with such dams (WCD, 2000, Policy Principle 3).

Environmental and social impacts

The environmental and social impacts of ROR hydropower vary considerably depending on the project scale, sub-type (pure, pondage or diversion) and river basin setting. Figure 14 is from the strategic environment assessments (SEAs) of 11 proposed dams on the lower Mekong mainstream completed in 2010 (MRC, 2010a). All these major schemes are categorised as pondage ROR and many have a watts to square metre ratio of over 10 (see Section 6.3). The need for resettlement was low as the reservoirs were formed mainly in the river channel. The main concerns were the barriers dams presented to fish migration, essential sediment flows and the aquatic ecosystem functionality.

The MRC-led assessments of large ROR schemes reveal the many trade-offs that national regulatory systems and regional agreements have to grapple with and their context-specific nature. In this case the carbon offset from equivalent thermal generation in the regional power markets, net of calculated 'worst case' reservoir emissions, was estimated to be over 50 million metric tonnes of CO_2 equivalent per year using CDM methodologies.

Figure 14. Environmental and social impacts of large ROR hydropower schemes



Source: MRC (2010b).

Consideration of hydropower ROR in a low-carbon strategy for the power sector

Depending on their characteristics, hydroelectric plants can cover the full spectrum of power duties in an electric power system, a capability which is unique to hydropower.[51]

51. Hydropower offers a range of functions needed in power systems operation that other generation sources do not provide, depending on the type of hydropower. Run-of-river plants without pondage operate as base load plants. With pondage, run-of-river plants operate as peak load in the dry season and mid-load to base load in the wet season. Hydropower storage plants normally operate as peak or mid-load, but some base load operation may be needed in the wet season. Multipurpose projects may have different operating regimes depending for example on irrigation requirements. Pumped storage projects pump using base load power and produce power at peak load. Storage also provides dynamic duties including spinning reserve and voltage, frequency and VAR control. For further details see IEA (2012).

The carbon benefit of hydropower comes when it displaces fossil-fuel generation in domestic or regional power markets. Although ROR schemes generally have the advantage of lower net emissions than storage hydropower due to their smaller reservoir size, the picture becomes more nuanced when assessing the whole power sector for low-carbon potential. Storage hydropower may play a uniquely important role in facilitating intermittent large-scale renewable energy, particularly wind, but also solar and pulse ocean technologies such as wave or tidal power. This has implications for low-carbon strategies at all levels, from local, to national and regional (see Box 9).

Box 9. Nordic hydropower complements Danish wind power to achieve lower regional emissions

In future, power balancing must be made with non-fossil energy sources, and hydropower may be particularly important in this role. Developing technologies for the large-scale storage of the energy generated from intermittent and seasonal wind power is an important issue. Denmark imports hydropower from Sweden and Norway as a backup for its wind-power generation. The Nordic countries have a well-developed interconnected network that can accommodate Denmark's intermittent electricity generation.

In countries with a large supply of hydropower, like Sweden, hydropower backs up wind power in addition to supplying base-load electricity.

The benefits from low-carbon emitting renewables can only be felt where they are supported by large-scale hydropower.

Source: Royal Swedish Academy of Sciences (2010).

Decisions about targeting support only on certain types of hydropower need to be strategic if the aim is to maximise carbon mitigation opportunities and adaptation. What is 'carbon mitigation best' depends on a mix of:

- the hydropower project characteristics
- the river basin situation
- the national power sector situation (generation mix and renewable energy potential)
- the regional interconnection situation (generation mix and renewable energy potential).

Box 10 illustrates the complexities of relying on run-of-river in Nepal and the relationship to decarbonising the power generation mix. Without some storage hydro, Nepal needs to import fossil fuels for thermal generation in the dry season. Many countries in Asia are in a similar situation. From a carbon-mitigation perspective, it makes the case for a country-level approach on top of a project approach to targeting hydropower support, using the overall carbon reduction potential as a consideration.

Box 10. The limitations of relying on run-of-river alone: the implications for Nepal

Nepal has no hydrocarbon resources and some 43,000 megawatts of hydropower potential. Wind, solar and biomass have a role in the electricity supply mix, but will not fuel the economy or its growing urban populations. Nepal is not eligible for CDM carbon finance for hydropower schemes because of additionality. Nepal currently has lots of run-of-river schemes, but because of its monsoon hydrology, it lacks power for 8-10 hours a day outside the short monsoon season. This maintains widespread poverty and conflict and drives unsustainable fuelwood use. Apart from storage hydropower, Nepal's only option is to import hydrocarbons to meet peak demand – which its government cannot afford.

Source: Discussions at ADB Nepal Energy Investors Forum, 13-14 October 2011, Kathmandu, Nepal.

6.4 What evidence for the 20 megawatt limit?

The EU Linking Directive sets a cut-off point of 20 megawatts for the size of projects required to respect the WCD, without explaining how this limit was determined and what evidence is available to justify the choice. Projects smaller than this do not need to comply. While there is no commonly accepted international classification or standard for small, medium or large hydro, a number of metrics exist.

The International Renewable Energy Agency defines six categories of hydropower (see Table 13) that includes a 'medium hydro' category of between 20 megawatts and 100 megawatts. Different countries around the world define 'small hydro' at different levels (Table 14). Moreover different authors do not necessarily agree on the cut-off for each country (for example see the different values given for the United States and China in Table 14). Despite this, these tables may indicate some consensus around the figure of less than 20 megawatts as a definition of 'small' hydro. Although some countries recognise up to 50 megawatts European countries tend to be at the smaller end of the scale.

Table 13. Categories of hydropower plant by size (IRENA)

Large hydro	>100 MW	Feeding into a large electricity grid
Medium hydro	20 MW to 100 MW	Almost always feeding a grid
Small hydro	1 MW to 20 MW	Usually feeding into a grid
Mini hydro	100 kW to 1 MW	Either stand-alone, mini-grid or grid connected
Micro hydro	5 kW to 100 kW	Provides power for a small community or rural industry in remote areas away from the grid
Pico hydro	Up to 5 kW	Used in remote areas away from the grid

Source: IRENA (2012).

Table 14. Definitions of 'small hydro' worldwide

Country/organisation	Megawatts	Country/organisation	Megawatts
Australia	<20*	Norway	<10†
Brazil	<30*†	Philippines	<50*
China	<50†, <25*	Sweden	<1.5†, <15*
Canada	<50*†	UK	<5*
European Union	<20†	United Nations Industrial Development Organization (UNIDO)	<10*
India	<25*†	USA	5-100†, <30*
New Zealand	<50*	Philippines	<50*

Source: Varun *et al.* (2008) (values shown as *); IRENA (2012) (values shown as †).

There is a general assumption that larger hydropower projects have greater impacts than small ones, which, if averaged over many projects would probably be correct overall. Having said that, even small hydropower projects can have significant impacts if sited in sensitive locations or designed and operated in ways that increase rather than minimise adverse project-specific impacts, or the cumulative impacts on the river basin setting. Very large projects can also have minimal impacts if sited in uninhabited areas with minimal local and downstream biodiversity.

Equally, while installed capacity as a key measure has the benefit of being easily measurable and clear, there is unlikely to be a clear linear relationship between installed capacity and impact. Project impact is always likely to be dominated by site-specific considerations. In this sense adopting 20 megawatts as the point at which environmental and social impacts need to be screened is an effective, if blunt, instrument that captures and assesses projects most likely to have the most significant impacts. As Table 14 shows, the 20 megawatt limit is an acceptable cut-off point by many countries' standards.

Additional work would be needed to determine an evidence-based limit, but it would undoubtedly run into the same 'siting' issues referred to above and not be fully objective.

Broader considerations include:

- The WCD did not identify size thresholds for considering environmental and social impacts of hydropower or other dams, but rather it indicates assessments needed to be made in relation to a particular dam and river basin context.
- Installed capacity is not the only possible proxy for a project's size, or scale of potential impact. Other factors may be equally suitable, such as average annual energy production (GWh) and reservoir area (km^2), but they tend to be harder to measure and vary annually or seasonally.

- There are also situations where a number of smaller projects, such as conventional small hydropower projects or the new hydrokinetic technologies,[52] may be packaged as a single project, where the cumulative impact becomes an important consideration from an environmental and social impact perspective – and also from a carbon perspective.

For practical purposes there needs to be some lower limit, with micro, mini and small hydropower schemes screened and addressed in a manner appropriate to their local scale. Nevertheless, this is an area that may be subject to further discussion among the different stakeholder interests:

1. Whether a more appropriate lower limit should be considered for single projects, and also whether a method is needed to address the cumulative impacts of many smaller projects packaged as a single project.
2. Whether ratios other than installed capacity/reservoir area would be appropriate as alternative threshold values (for example the CDM measure of gigawatt hours per year/reservoir area).
3. Whether methods should also take into account the extent to which a particular size of hydropower project 'firms up' potential generation from other low-carbon renewable energy generation in the system, for example by facilitating greater use of wind or solar generation and the extent to which this reduces the net environmental and social impacts of any given quantum of low-carbon electricity supply.

There has been some discussion about widening dialogue to include such considerations in the past at multi-stakeholder conferences and forums around the CDM and the voluntary carbon markets, but without conclusion.[53]

Experience in some countries has also shown that it is helpful in moving such debates forward to separate the role and function of micro, mini, small, medium and large hydro as electricity supply options for different settings, for example: individual rural supply; isolated rural (local) supply; grid supply for use in the country; and combined or dedicated export (Nepal Electricity Authority, 1998; UNEP, 2003).

52. See how hydrokinetic energy works (Union of Concerned Scientists, 2008).
53. The ongoing dams debate illustrates different perspectives on whether hydropower should be eligible for public carbon financing support. One illustration is the range of issues covered in the 5th World Water Forum, Istanbul 2009, Bridging Divides for Water (World Water Council, 2009). Several issues are reviewed in the Energy and Resources Group Working Paper (Haya and Parekh, 2011), which also discussed EU WCD evaluation requirements. Another perspective is the International Hydropower Association's 2010 Statement on Hydropower and the CDM (IHA, 2010b).

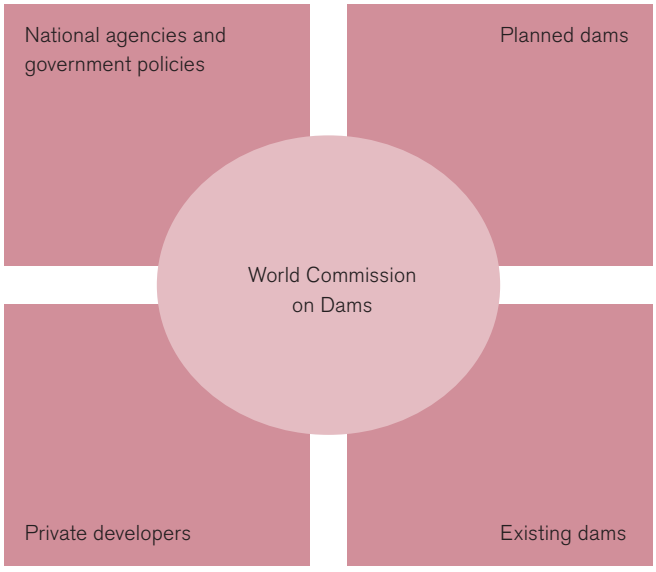
Application of the WCD framework

7.1 How the WCD is used or applied

The WCD recommendations have been taken up and acted on by a range of national and international institutions and processes. In some cases the entire framework has been adopted and in others only parts of it, while a further group have adopted similar ideas or approaches without them necessarily coming from the WCD (Figure 15).

The German government was very enthusiastic about the WCD report and was one of the first to accept the WCD's recommendations: 'The German Federal Ministry for Economic Cooperation and Development (BMZ) gives its support to WCD and DDP because we believe that dialogue between all interest groups is the only way to resolve conflicts over dam projects. The WCD report fully meets our expectations. It provides a viable, useful frame of action with the capacity for ensuring the sustainability of future dam projects' (GTZ, 2004).

Figure 15. The WCD in context



Shortly after publication of the WCD report, the European Parliament adopted the WCD criteria and guidelines as a requirement through the EU Linking Directive (EU, 2004), and we review the implementation of this directive in Section 7.2. In 2012, the OECD Council recommended its members 'refer to relevant international sources of guidance such as, for example, where appropriate, the Hydropower Sustainability Assessment Protocol and the Core Values and Strategic Priorities of the World Commission on Dams (WCD) Report for hydro-power projects in the absence of any relevant industry-sector EHS guidelines, when reviewing export credit deals' (OECD, 2012).

The multilateral development bodies use the WCD as a reference point, especially for EIA studies, and within the consulting world it is seen as important contextual reading that describes a set of values and proposals for good practice and good decision-making processes that lead to sustainable outcomes. It is one of the rare volumes to deal holistically with the history of large dams in all their complexity, and provides an 'essential primer' on the issues involved. It also provides something of a menu from which ideas can be plucked and applied as appropriate to local contexts. The ideas therein can be, and often are, challenged but it creates a fixed point around which different actors can converge or diverge.

The most important consideration is that the WCD made recommendations that apply to a whole range of different governmental, industry and non-governmental actors and no single entity can implement all of them. Compliance with the WCD for any individual project is therefore conceptually challenging. In most cases, several actors need to align, over many years of planning and delivery, to ensure that WCD is 'respected'.

7.2 The EU Linking Directive

The preamble of the Linking Directive states:

> Criteria and guidelines that are relevant to considering whether hydroelectric power production projects have negative environmental or social impacts have been identified by the World Commission on Dams in its November 2000 Report 'Dams and Development — A New Framework for Decision-Making' by the OECD and by the World Bank.; and in Article 11 (b) 6. In the case of hydroelectric power production project activities with a generating capacity exceeding 20 megawatts, Member States shall, when approving such project activities, ensure that relevant international **criteria and guidelines**, including those contained in the World Commission on Dams November 2000 Report 'Dams and Development — A New Framework for Decision-Making', **will be respected during the development** of such project activities. (EU, 2004; emphasis added).

The wording of the directive calls for 'respect' of the WCD, which is a legal grey area, as well as insisting that this is during the 'development' of project activities, without referring to their implementation. There appears therefore to be no obligation to actually deliver outcomes. The directive goes further than most

stakeholders in calling for respect of the WCD criteria and guidelines, which most have not accepted, while not referring to the strategic principles, which many have. In implementing the directive it is up to EU member states how they interpret and implement their domestic policies based on it.

From 2005 to 2009, projects submitted ad hoc compliance reports on the degree to which they respected WCD or not, each according to different approaches and templates and with little standardisation. In 2009, the European Commission agreed with member states a voluntary template and process for assessing the degree of respect for WCD (DECC, 2011). This has been in use since 2010.

The process for accreditation adopted by one EU member state, the UK, has been assessed as part of the present scoping study and is as follows:

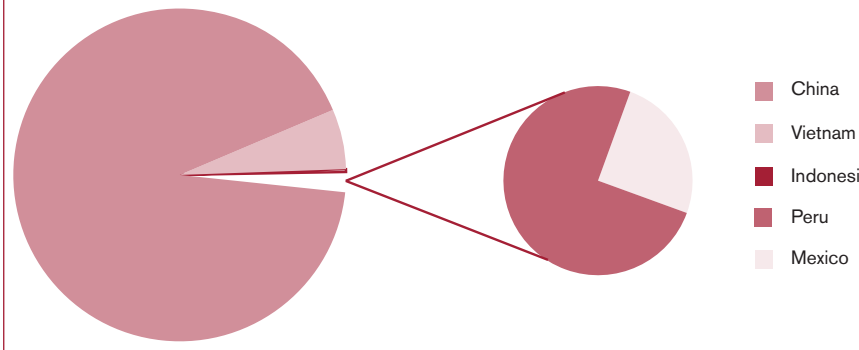
- Entities seeking the approval of a project by member states should provide evidence demonstrating compliance of the project with the requirements of Article 11b (6) of the directive.
- To demonstrate compliance with Article 11b (6), the project proponent should submit a separate compliance report with the application documents to the designated national authority (DNA)/designated focal point (DFP) of the member state or an entity designated by the member state to fulfil this function.
- The compliance report (based on documents, visits and interviews and following the outline provided in the Compliance Report Template) may be prepared either by one of the participants in the project or by a third party on behalf of the participant (an outside consultant/expert, or a DOE).
- The compliance report should be validated by a Designated Operational Entity (DOE) or an Accredited Independent Entity (AIE) licensed for that particular Sectoral Scope, or other qualified independent third party accepted by the member state, hereafter referred to as 'Independent Validating Entity' (DECC, 2011).

This process lies in the hands of the dam developer and it is the project proponent who provides a self assessment of compliance with WCD guidelines. In addition, the UK DNA, the Environment Agency, has stated that as all WCD priorities and guidelines cannot be applied to all projects, discretion will be used in determining which measures are deemed essential on a project by project basis (DECC, 2011, p. 22). The UK DNA therefore appreciates that some guidelines may not be relevant for all hydroelectric projects or are not necessarily designed to be applied in full.

Data on how many projects have been rejected by the UK focal point, if any, are not available for this review. It has therefore not proved possible to assess what percentage of applications are successful, which may have given some insight into the ease with which projects are able to meet the required criteria and guidelines.

The UK had granted 940 projects carbon credits to 31 December 2012, of which 238 (25 per cent) were for hydropower projects. As Figure 16 shows, 92 per cent of these were in China.

Figure 16. Geographical distribution of UK-approved EU carbon credit for hydropower projects



Source: Environment Agency (2012).

Annex 5 presents the WCD Strategic Priorities and analyses and compares the wording and intent of each one with the equivalent questions from the EU template. Chapter 8 summarises the findings of this analysis.

7.3 River basin and regional approaches to good practice

Environmental and social standards increasingly recognise the importance of placing decisions about hydropower and dam planning and management in a river basin setting. Since the Dublin Principles of Integrated Water Resources Management were developed in the early 1990s considerable emphasis has been placed on linking dam planning and management to the river basin context, such as the approaches embodied in the European Water Framework Directive (EU, 2000) and the RAMSAR Convention and Guidance (Ramsar, 1971) and explicitly recognised in the WCD's Strategic Priorities (2000) and the HSAP (2010a).

In keeping with this general thrust the countries of the Mekong river have developed tools and guidelines for sustainability assessment adapted for the Mekong regional context. The four member countries of the Mekong River Commission (Cambodia, Laos, Thailand and Vietnam) have drawn on a range of existing sources and identified new approaches inspired by the WCD and the HSAP.

One example is the Rapid Sustainability Assessment Tool (RSAT) developed by a partnership of the Asian Development Bank, the Mekong River Commission and the WWF (MRC, 2010b). The RSAT looks at sustainability of hydropower in a river basin context, with either single or multiple hydropower projects that are existing or planned, or a mixture of both. The voluntary tool was developed in close co-operation with the International Hydropower Association Forum that was working on the HSAP at the time. The Preliminary Design Guidance (PDG) explicitly states that it was inspired by the WCD (MRC, 2009). The four countries

reached agreement on the PDG that became the basis for the MRC Procedures for Notification, Prior Consultation and Agreement (PNPCA) for consideration of transboundary projects such as the Xayaburi Project in Laos (MRC, undated). A similar process, led by the Water Resources Coordination Unit of ECOWAS, was undertaken in West Africa between 2009 and 2011, culminating in the endorsement of a set of regional guidelines for large water infrastructure, again inspired in part by the WCD and drawing also on World Bank and AfDB operational safeguards (Water Resources Coordination Centre, 2012).

These examples illustrate how regional and basin institutions are designing and adopting their own internal guidance appropriate to the realities and needs of the region or basin. In doing so they draw on multiple sources of good practice, including the WCD, that may add a layer of complexity to the safeguarding system but nevertheless should apply to all dams no matter who funds them. Initially they start as international guidance but gradually become incorporated in legal documents, for example as an annex of the river basin charter of the Niger Basin Authority (Niger Basin Authority, undated).

Further details of such processes are given in Annex 4.

7.4 Respect for the WCD provisions – overall assessment

The EU template demonstrates the challenge inherent in assessing respect for the WCD framework in a straightforward and pragmatic manner. The WCD Strategic Priorities are expressed in terms and concepts generally different from those used in the engineering profession. They include measures that refer both to national policies and to project developers, to irrigation dams and to hydropower dams, and to planned and existing dams. Most project proponents requesting carbon credits are private investors building new hydropower plants, and making their request at the project planning stage. It is not clear how far developers should be held responsible for WCD recommendations on national policies and frameworks which do not apply, or only partially apply, to individual dam projects, as well as for those WCD recommendations that refer to existing dams. In general, the process and template does not address the majority of the national or basin-level processes that the WCD considered critical to establishing consensus for 'the best option', as well as filtering out the projects considered most socially and environmentally damaging. The WCD recognised that once project design is well advanced it is often impossible to look effectively at alternatives.

In general the EU template has simplified and watered down the aspirations of the WCD. It uses standard project development terms to describe difficult concepts and it does not systematically meet the challenge inherent in transmitting the concepts behind the words. This has the advantage of making the template understandable to project developers, but the disadvantage of not clearly communicating, measuring or analysing respect for many of the WCD's core intentions.

This is best seen perhaps in the sections on social impacts (SP5). The commission's intention was to achieve well-informed, negotiated, legally binding outcomes that respected entitlements and addressed risks for people affected by the project. Little of that language appears in the EU template, being subsumed into the general terms of compensation and resettlement plans that the engineering community feels more comfortable with and pretty much reflect 'business as usual'. Verification is hard and where reviews have been undertaken by international NGOs, they have cited many dams that they claim fall short of WCD provisions. For example, a study of WCD compliance visited projects that had been supported by CDM financing and noted some of the adverse environmental and social impacts that would not have occurred had WCD provisions been fully implemented (Box 11). These assessments are linked to funding from anti-dam NGOs and have not been independently verified.

Box 11. Field review of WCD compliance for projects receiving credits

Allain Duhangan Dam (192 megawatts), India, approved May 2007. The project has suffered from inadequate rehabilitation of affected villages and environmental violations. The Office of the Compliance Advisor/Ombudsman of the International Finance Corporation (2005) verified that the project developer had not ensured enough irrigation and drinking water for affected villages. The project was also temporarily halted and fined for violations of Indian forest conservation law due to illegal felling of trees, dumping of waste and road construction.

Bhilangana (22 megawatts), India, approved January 2007. Affected villagers never consented to the project and actively opposed the project. Villagers opposed to the project were jailed multiple times and 29 people were arrested in November 2006 and were forced to sign a document stating that they would stop resisting the project. Significant physical abuse by the police was reported.

Jorethang Loop (96 megawatts), India, approved February 2008. A survey of the affected villages by an Indian NGO after the public hearing found that many villagers were not informed about the meeting. Requests by villagers and NGOs of project documents including the environmental impact assessment were ignored by the project developer.

Xiaoxi (135 megawatts), China, approved December 2008. A field report commissioned by International Rivers documented problems include the forced eviction of 7500 people, a failure to restore pre-eviction incomes, arbitrary and inadequate compensation for resettlers, a lack of legal recourse for those who suffered losses, and a non-independent EIA process marred by conflict of interest.

El Chaparral (65 megawatts), El Salvador, approved March 2010. The public consultation process has been criticised as being neither open nor transparent. Adverse impacts include the displacement of 10,000 families in three municipalities, habitat loss of endangered flora and flooding of archaeological artifacts. The dam has divided and destabilised the community between those in favour and those opposed.

Barro Blanco (29 megawatts), Panama, approved January 2011. Although the dam site is in an area recognised by the Panamanian government as the collective property of the Ngobe indigenous people, only members of the non-indigenous population were consulted. The project developer has also been accused of human rights abuses. An investigation by the European Investment Bank into human rights abuses at the dam site resulted in the project developer retracting their loan request and only then applying for registration under the CDM.

Source: Haya and Parekh (2011).

If the intention of the WCD was to set the bar for the social and environmental dimensions of sustainable dam construction higher, then the EU voluntary assessment process for access to hydropower credits has lowered it. Not only because it allows developers to submit their own assessments, but because of the nature of the questions asked, and the lack of clarity about what degree of non-respect for the WCD constitutes a deal breaker when applications are assessed. For example, the compliance review of Xiaoxi submitted by the developer openly acknowledged that the project did not meet WCD guidance, yet was accepted (see Box 12; International Rivers, 2008b).

Box 12. Extract from WCD compliance report for Xiaoxi Dam, China

'Stakeholders have been identified. Apart from the project owner and the local/regional government the obvious stakeholders for operational issues are the villages affected by the project. The project owner and the local government took part in the decision process of the project. Other stakeholders (local people) knew about the project in the early stage of FSR and were informed about the project in more detail in the survey stage regarding occupied lands and resettlement of the FSR in 2004.

The concerned villagers and their leaders were not involved in the decision process. According to our information the project owner negotiated the project with the provincial and regional government. **This is a deviation from several guidelines of the WCD report.**

On the other side, as outlined in section 1 and 2 of the protocol, all affected people considered the entire project very positive and they all have improved their living environment. On the other side the affected people have improved their living environment. **As the core requirement of "no social or cultural disadvantages" has been achieved the essence of the WCD guidelines is still fulfilled.'**

Source: TUV SUD Industrie Service (2008); emphasis added.

Reportedly 92 per cent of hydropower dams supported through the UK DNA to date are in China. China was quite dismissive of the WCD report when it appeared (along with Turkey and India) with transboundary issues being of particular concern. The Chinese Commissioner appointed to the WCD (Shen Gouyi) withdrew from the WCD after 18 months due to a potential conflict of interest with broader Chinese interests. So it is perhaps surprising that many new Chinese dams now 'respect' WCD criteria and guidelines to a sufficient degree to obtain the lion's share of EU carbon credits allocated by the UK national authority.

China's position has, however, not been static over the years (e.g. Hensengerth, 2010). It has established the Ecosystem Research Centre for International Rivers (ESCIR) to provide technical exchanges with the Mekong countries and the Mekong River Commission. Attitudes have certainly evolved in China over the last decade, as demonstrated by the active participation of Chinese experts in the HSAF, and the use of the HSAP by Chinese institutions such as ESCIR. Despite this, it appears more likely from the review of the EU voluntary template (see Annex 5) that the large volume of Chinese projects passing the EU assessment process is due to the process being weak at ensuring 'respect' for the WCD, rather than China fully adopting WCD approaches over the last ten years.

Having said that, the screening process, as with other conditionalities related to good practice, serves to increase awareness by requiring project developers to make these assessments, and captures projects that would otherwise escape the voluntary and regulatory frameworks. In this regard its application may result in improved practice over time, and this would be considerably helped if there were some form of independent post-implementation evaluation system or review put in place. The HSAP could prove a useful tool in this regard as it promotes constant self-improvement. In the absence of such a review, NGOs will continue to point to project deficiencies that may prove anecdotal rather than systemic.

A broader issue arising from the EU project screening process concerns the application of WCD guidance at different levels (national, basin and project). Many of the WCD requirements are not project specific, yet the process it proposed was intended to filter out projects with unacceptable impacts before political and financial investment in project design made it unfeasible to backtrack, if impacts proved severe. Dams that emerged from that participatory process were considered 'the best option'. Moreover, at the strategic planning stage – meaning the sector- and basin-level strategic planning processes that lead to the identification of programmes and projects – assessments and communication should reinforce the political legitimacy of decisions. Dams that emerged from a genuine participatory process early in strategic planning may be considered for the options mix.

Most stakeholder interests in the debate over large dams acknowledge the central importance of comprehensive options assessment. The World Bank for example highlights the need to move options assessment upstream in national planning systems, particularly where countries may choose among dam and non-dam options (World Bank, 2003b).

The WCD process explicitly recognised the challenge of giving a yes/no decision solely on the basis of a fully designed and completed project, yet that is the difficult situation faced by the CDM.

8

Conclusions

There has been a renewed focus on hydropower and large dams in recent years as a mitigation and adaptation response to climate change. This has also led to a resurgence in the attention focused on their local and downstream environmental and social impacts and the degree to which these can, and should, be internalised and addressed.

Key issues and concerns

New dam projects must comply with national legislation as a minimum standard. In addition they may need to meet funding conditionalities or safeguards from donors as well as voluntary guidelines of various kinds. A proliferation of safeguards, standards and guidelines is making harmonisation increasingly problematic. Different approaches divide the issue in different ways and are therefore difficult to compare with each other.

It is challenging to assess what proportion of dams are indeed affected by the various sets of safeguards. China, which imposes few additional safeguards over national guidelines, is playing an increasingly important role in funding dams. As much as 75 per cent of private infrastructure funding in Asia does not come from organisations subscribing to the Equator Principles. The World Bank safeguards capture perhaps 3-5 per cent of dams in planning worldwide. Taken together, these findings suggest that only a limited proportion of new dams are required to meet more than national legislation. On the other hand, regional and river basin organisations are increasingly incorporating good practice into their guidelines, broadening the number of projects following these approaches irrespective of the donor or other financing partners. This overview suggests that the majority of new dams being built today are subject only to regulations and safeguard in national legislation, with no additional dam-specific safeguards put in place by project developers and financers. Any strategy that seeks to promote improved social and environmental outcomes from dams should therefore consider how to bring best practice into mainstream regional, river basin or national legislation and build the capacity to implement it effectively.

The World Commission on Dams (WCD, 2000) established a ‘gold standard’ that describes an ideal framework, but is probably unobtainable for many countries with weak internal capacity to carry out participatory planning and decision making, especially at the early stage of the needs and options assessment. As many of the WCD decision-making processes address the much wider framework of national or basin policy, which are well beyond the remit of any individual developer, it can only be partially applied to individual dam projects.

As international organisations update their sustainability safeguards, ideas and concepts are increasingly converging towards the WCD ideal. Practical measuring tools are also emerging.

The Hydropower Sustainability Assessment Protocol (HSAP) offers a more practical way than the WCD to measure the degree of good practice in an individual dam project. It draws extensively on the WCD but is targeted at those components that refer specifically to individual dams, removing the complexities arising from the WCD's focus on national policy and basin-wide considerations. It has the advantage of a group of certified assessors (which WCD does not) and independent oversight of the protocol design that should allow it to be updated, monitored and learned from. This is not possible for the WCD as the commission was disbanded shortly after producing its report. The WCD is now 13 years old and while many of the individual ideas and concepts will live on, as a complete policy package it will be increasingly superseded.

The adoption of the HSAP by the hydropower community shows that many of these approaches also make good business sense, and the HSAP's staged approach to scoring progress allows different projects to see where they lie on a continuum of good practice, from Level 1 to Level 5. Moreover, the protocols for each project stage can be applied and repeated periodically. This allows schemes and funders to measure progress using multi-stakeholder and open processes and to identify capacity-building priorities.

The HSAP has captured many of the key concepts within the WCD, making them understandable and to a certain degree practical and measurable, although it still relies on certified and independent expert opinion for assessment. In some areas, such as biodiversity mitigation plans for endangered and threatened species, the HSAP simply assesses their existence, not the process for adopting them or the detailed nature of their provisions, but given the many different types of large dam it is difficult to be normative at this level. The HSAP's approach to assessment is rather different to the WCD's and uses a scaled approach to assessing protocol compliance, leading to a very helpful spider diagram that visually and numerically captures the key strengths and weaknesses. Results from the projects assessed so far show that even projects respecting developed-country regulations do not automatically obtain a Level 5 score, indicating that in some areas, the protocol continues to exert upward pressure on best practice. When results from more assessments planned in Africa are completed, more evidence will become available on tracking social issues.

The EU Linking Directive (2004) requires projects above 20 megawatts requesting carbon credits to 'respect' the WCD criteria and guidelines. As the WCD was never seen as a blueprint, and explicitly states that it should be adapted to local realities and contexts, this is a considerable task. The voluntary template used by EU countries to assess how far WCD principles and guidelines are being respected is a significantly watered-down version of the aspirations laid out in the WCD Strategic Principles. Its descriptive approach is even less normative, measureable or standard-

setting than the WCD. Even easily measured WCD recommendations, such as the existence of a legally binding agreement with resettled people, are not included. Self assessments are made by the project developers or their appointed certifiers and the process is not an independent one. No independent monitoring of actual outcomes has been undertaken so it could be argued that the EU process has also not fully met the compliance components of the very WCD framework it promotes.

A broader issue arising from the EU project-screening process concerns the application of WCD guidance at different levels (national, basin, and project). Many of the WCD requirements are not project specific, yet the process it proposed was intended to filter out projects with unacceptable impacts before political and financial investment in project design made it unfeasible to backtrack if impacts proved too severe. Dams that emerged from that process were considered 'the best option'. This WCD recommendation explicitly recognised the challenge of giving a yes/no decision solely on the basis of a fully designed and completed project, yet that is the often difficult situation that the national authority applying the EU screening process finds itself in.

A review of implementation of projects receiving EU credits would help to establish an independent evidence base on compliance with WCD provisions. No information is available on how many projects have been rejected for failing to respect the WCD and why. It is not therefore possible to assess whether this requirement is acting as a brake on funding hydropower projects for mitigation purposes. Some findings suggest it is not – for instance, although China has not accepted the WCD recommendations, 92 per cent of the 238 CDM hydro projects supported by the UK under the EU Linking Directive are located in China. It appears more likely that this is because the assessment process is weak, rather than because China has adopted WCD approaches in recent years.

Areas of disagreement

Some important fault lines remain in the debate around social and environmental safeguards. The main one concerns where stakeholders lie on the information-consultation-participation-free, prior and informed consent-negotiated outcomes spectrum. The WCD considered that signed and binding agreements were the only way to make consultation and negotiation meaningful. Other stakeholders, notably the World Bank, felt that this gave local communities an undesirable right of veto over projects in the national interest. The HSAP uses the term 'agreement'. It is very challenging to independently measure the real degree of involvement of local people in decision making in the absence of a signed agreement, as claims and counter-claims can be made as to their degree of involvement and 'agreement'. There are currently few good yardsticks to measure degrees of information-consultation-participation, although the IFC has made some progress (see Annex 6). Secondary areas of more nuanced disagreement concern the compliance plans, and the details of biodiversity compensation and mitigation plans.

Where the WCD was more vociferous in asserting a rights-based approach (after all, its chairman was a human rights lawyer) along with assessing the risks associated with social and environmental impacts, these ideas have been taken up more reluctantly. In the HSAP there is little discussion of these topics, and then mostly at Level 5, perhaps to enable countries such as China, for which rights are a vexed issue, to still participate. The World Bank board may be faced with similar challenges.

The need for a comprehensive assessment of all the options before supporting a large dam project, directly or indirectly, has been a longstanding issue in the debate. The WCD stressed the fundamental importance of comprehensive options assessments to screen projects and programmes in the early stages of national planning processes. The assessment should take place well before financial and/or political interests consolidate, effectively preventing other viable options, particularly non-dam ones, from receiving due consideration. Few international standards or safeguards directly tackle this central issue even though stakeholders increasingly understand the importance of a 'level playing field' to allow creative solutions to come forward.

Which safeguards to apply and when

Run-of-river projects can have significantly lower impacts than storage hydropower projects although these depend on location in the river system and other factors. For example, physically blocking the river has significant impacts on vertical connectedness that can affect any migratory biodiversity and sediment flux, thereby altering river morphology. Some schemes classified as run-of-river involve diversions which can also dry out long stretches of river, making it difficult to generalise about the sustainability of ROR schemes. Large hydro projects may also be essential to support ROR schemes or energy generation from intermittent renewables due to their base load support and storage capacities. Rejecting large dams could mean that this gap is filled by fossil fuels instead, and broader emission reduction benefits are lost.

There is no internationally agreed definition of large and small hydro, beyond the ICOLD definition of a 'large dam' (ICOLD, 2013). The EU Linking Directive has adopted an installed capacity of 20 megawatts as the dividing line between large schemes, which need to be reviewed for WCD compliance, and small schemes, which don't, but the impacts will vary according to the local situation. Using installed capacity as a measure of environmental or social impact has the merit of establishing a clear cut-off point and probably ensures most of the higher-impact projects will be reviewed. It is a fairly blunt instrument when done at the project level but is a necessary precautionary step in the absence of any broader WCD-style national or basin-level screening out of project sites with unacceptable impacts prior to individual project design. The Clean Development Mechanism has adopted a minimum threshold of 4 watts per square metre of reservoir for eligibility for funding, which has pushed funding for CDM projects towards the ROR end of the spectrum.

Where a project is funded by multiple donors or funding streams, the interpretation of which safeguards are required may prove challenging, particularly when voluntary guidelines are also relevant. In most cases, the more stringent provision should normally apply but with many emerging sets of standards, finding ways to do this without multiplying transaction costs is key. The general application of IWRM principles have also evolved since the WCD reported, and there is increasing consensus that participation and negotiation are key components of long-term sustainability. Regional and river basin bodies are increasingly developing and adopting their own internal good practice guidance that will be applied to all dams in the region, irrespective of the funding stream, creating another layer of compliance requirement. This is important as dams have specific impacts and considerations that are not necessarily captured satisfactorily in the more general national legislation that applies to all infrastructure projects. Significant issues are noted with respect to the lack of human capacity to deliver sustainable dam projects in many countries.

This review takes the view that any strategy that seeks to promote improved social and environmental outcomes from hydropower dams should consider how to introduce international best practice into national legislation and build the capacity to implement it as part of the longer-term approach.

China is currently the dominant global force in hydropower financing and construction, as well as in hydropower carbon financing. Broad engagement with China as standards and practice evolve will be essential if locally sustainable outcomes are to be promoted worldwide. Bringing more private Asian banks into respecting the Equator Principles could also help achieve this end.

As originally noted by the WCD, there are very few evaluations of large dams after they have been built. More focus is needed on monitoring real outcomes in the field. The EU Linking Directive has now been in force for nearly ten years and the UK alone has supported 238 projects. Have the conditions imposed by EU member states led to the more sustainable outcomes expected, and what has been learned to inform future policies?

The wording of the different provisions do not help with their interpretation. For instance, the EU Linking Directive speaks of ‘respect for’ the very detailed WCD criteria and guidelines, rather than the seven more broadly accepted WCD Strategic Priorities. On the other hand, the OECD says states ‘may refer to relevant international sources of guidance such as, for example, where appropriate, the Hydropower Sustainability Assessment Protocol and the Core Values and Strategic Priorities of the World Commission on Dams (WCD) Report for hydro-power projects’ (OECD, 2012), but does not refer to the criteria and guidelines. Some legal clarification of what this means in practical terms would help in cases where guidance is contradictory and constraining on project design.

This review concludes that the most practical and effective tool currently available for measuring and communicating good practice, and the degree of respect for WCD guidelines and general good practice of *individual projects,* is the HSAP. It has the merit of being multi-stakeholder led and industry accepted, and gives a numerical and transparent output. Further, it has a group of certified assessors who can ensure some degree of quality control, and a structure that should allow the tool to be constantly updated and relevant. Only nine assessments were available at the time of this review but as more become available, appropriate feedback can be given to assessors and to the oversight bodies to ensure its effective application.

In summary, as the WCD concluded in 2000, '… the end of any dam project must be the sustainable improvement of human welfare. This means a significant advance of human development on a basis that is economically viable, socially equitable, and environmentally sustainable. It is broadly accepted this requires continuous improvement in practices – with practical, effective safeguard regimes backed up with appropriate multi-stakeholder monitoring, compliance and capacity building. When all factors are considered, it may be argued that the reduction in risk and uncertainty is in the interest of most, if not all stakeholders; and certainly society at large.' (WCD, 2000)

Key recommendations emerging from this review

While this review was undertaken primarily as a scoping exercise, we offer several recommendations with a view also to ultimately narrowing the gap between the aspirations of the WCD and current practice.

While they are primarily addressed to EU member states and EU bodies, nonetheless, the recommendations also have broader relevance to sharing lessons internationally on ways to continuously improve safeguards and maximise the adoption of good practice tools and techniques. The latter is particularly relevant because partnerships with developing countries are an essential part of the European Union's policy and its stated drive to reduce emissions of man-made greenhouse gases by building international carbon markets and advancing climate adaptation (European Commission, 2014).

These recommendations recognise the WCD (2000) was not prescriptive, or cast in stone. Rather the WCD argued for negotiated outcomes appropriate to each national, basin and local context. Moreover, safeguards are inherently dynamic tools. To be effective, they need to measure and reflect stakeholder perceptions of risk and uncertainty, take into account 'best available' information and analysis, and reflect societal values as they all evolve over time.

1. Agencies seeking to measure the degree of compliance of individual projects with WCD principles should increasingly adopt the HSAP as the most practical currently available evaluation tool, subject to the assessment teams reassuring third parties of the independence of the assessors.

2. Agencies should support more HSAP assessments in different contexts and geographies in order to boost the number of datasets available and gain experience, ensuring the feedback is incorporated into the protocol provisions, methods and approaches of the certified assessors.
3. Implement processes to develop regional or basin-level standards on environmental and social impacts that capture all hydropower projects in a harmonised manner, irrespective of the funding stream.
4. Formally review the effectiveness of the current EU Linking Directive's voluntary template and process. Monitor the outcomes of a subset of projects funded under the directive's carbon credit programme to establish whether respect for the WCD criteria and guidelines has indeed generated more sustainable outcomes and assess how this experience can inform future policy orientations.
5. Seek legal clarification of donor governments' precise commitments under EU and OECD obligations to 'respect' or 'refer to' various types of standards or guidelines and harmonise such interpretation between departments.
6. Although the EU has adopted 20 megawatts as the threshold for hydropower schemes requiring application of environmental and social safeguards, project proponents and financiers should also consider smaller projects in context and effectively assess their cumulative social and environmental implications.

These recommendations are for all stakeholders active in the global dams debate, and those who have views about the relative coherence of different safeguards, approaches and standards applied to hydropower projects worldwide.

More specifically, they are offered to government actors and stakeholders who actively participate in EU-supported processes on dam safeguards and the discussions on how safeguard concerns interconnect with water and energy resource, environment and climate change policies and programmes of the EU and its partners. This includes the key stakeholder interests from civil society, industry, finance and development communities.

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Annexes

Annex 1 Global trends influencing hydropower, standards and the carbon outlook

The outlook for hydropower, standards and carbon financing can be divided into five themes.

Theme 1. **The implications of power sector reforms for dam safeguards.** The nature and direction of regulatory reform in the power sector in most countries shape the selection of electricity demand-supply options today. These reforms mean the way in which environmental and social standards are applied to hydropower and the monitoring of their effectiveness are also changing.

Theme 2. **Asia's emergence as a global leader in financing dams.** The pace of dam construction in China and the region, coupled with China's emergence as a global centre for power-technology manufacturing under licence and technology-transfer arrangements, and financer of hydropower in other countries is key. To a lesser extent this is also happening in other BRICS (Brazil, Russia, India, China, South Africa) countries.

Theme 3. **The globalisation and diversification of dam financing.** Finance for water and power infrastructure is progressively shifting to the private sector under regulatory reforms, which vary from region to region and serve to encourage the use of new finance instruments and more diversified sources of finance and few common standards.

Theme 4. **Low-carbon and renewable energy policies for the power sector.** Renewable energy and 'green energy' policies are being adopted around the world. Hydropower complements intermittent renewable energy generation (e.g. from wind, solar and tidal generation technologies) to advance low-carbon strategies in national and regional power sectors.

Theme 5. **Shifts in global public attitudes.** Public attitudes are evolving on a range of factors, often pulling in different directions. These include attitudes to nuclear power after Japan's tsunami, expectations for companies and financial institutions to be more attentive to corporate social responsibility commitments, trade-offs related to mitigation of social and environmental impacts of hydropower, climate change, and the relevance of competing electricity demand-supply options in the power sector for climate-change mitigation and adaptation strategies.

These trends influence the proliferation and coherence of standards and safeguards for hydropower, as well as climate change mitigation and adaptation potential connected with the power sector. This is set against a backdrop of the

steady growth in fossil fuel generation in the global power sector overall, especially coal-fired generation in developing countries.[54]

Theme 1: The implications of power sector reforms for dam safeguards

The power sectors in most industrialised and developing countries have been undergoing structural change since the late 1980s, largely involving the introduction of competition into energy and electricity markets. These reforms (not without controversy) shape the selection of electricity demand-supply options and the frameworks to apply statutory and voluntary environmental and social standards on hydropower. In addition, the planning and regulatory systems for hydropower straddle the water, energy, environment and social sectors and are affected by reform processes in those sectors too. These reforms touch on concerns addressed in the WCD Strategic Priorities and policy principles.

Government concerns over spiralling infrastructure costs and public debt largely prompted the power sector reforms which started in the 1980s and gained pace in the 1990s. Other motivating factors for regulatory reform included the removal of barriers to innovation and change to allow market entry of renewables, more efficient conventional technologies, consumer-oriented energy services and low-carbon strategies. Generally, the shift has been from a single, vertically integrated state electricity monopoly towards more open markets for investment in generation with private-sector participation and competition, and to a lesser extent transmission and distribution (see Box 13).

The power sector reforms have also fostered or underpinned the trend towards the regional interconnection of national electricity grids and arrangements to pool power in many regions of the world. They have also fostered the formation of decentralised or distributed electrical systems, currently in their early stages, where on-site renewables may play a significant role in future.

In particular, the interconnection of grids by neighbouring countries has implications for large-scale hydropower. Developing countries may seek to develop larger hydro projects than they otherwise would to meet domestic demand, so as to export to regional power markets. Interconnected grids also increase the scope to deploy intermittent renewable generators on a regional scale (see also Theme 4 for a discussion on integrated strategies to lower the carbon intensity in regional power markets, e.g. wind-hydro).

54. Partly due to coal's relative availability and pricing in international energy markets, where the full cost of carbon is not internalised in the price of coal. To date there has been limited adoption of the more efficient 'super-critical coal technology' that reduces emissions. While data sources vary electricity generation represents about one-third of man-made emissions globally and this is projected to rise to 40 per cent by 2030 largely due to coal burning (IEA, 2013a). According to the 2013 Fact Sheet, 'CO_2 emissions from the power sector rise from 13.0 gigatonnes (Gt) in 2011 to 15.2 Gt in 2035, retaining a share of around 40% of global emissions over the period' (IEA, 2013b). See also the UNFCCC business as usual scenario: 'The Reference scenario is the Reference scenario of the IEA's *2006 World Energy Outlook* (IEA 2006)… By 2030, the power sector accounts for 44% of total emissions, up from 40% today' (UNFCCC, undated).

Box 13. Elements of global power-sector reform relevant to hydropower

- Removal of monopoly powers and corporatisation or commercialisation of the government power utility.
- The guarantee of non-discriminatory access to the power grid.
- Permitting partial or full private-sector participation and competition in generation and/or distribution.
- The development of a regulatory framework which reflects policies on market entry or exit in generation, transmission and distribution functions.
- Ensuring the regulatory framework promotes more efficient use of electricity and the enhancement of environmental and social benefits.
- The setting up of autonomous regulators; the separation of policy and regulatory functions within government with a transitional programme towards independent regulation.
- Possible divestiture of existing generation and distribution assets.

Clearly the nature of power sector reform has multiple implications for dam safeguards and the allocation of responsibilities to apply and monitor them. Apart from placing more importance on government regulation, it elevates the need for effective mechanisms and institutional capacity to continuously improve and openly apply national standards and to assess compliance with new requirements for international finance where they differ from national standards, and engage effectively with stakeholders and the media. This requires a pool of professional staff with multi-disciplinary expertise from physical, natural and social science disciplines. The evidence suggests there is a mixed picture at present in many developing countries that have, or are considering, hydropower as to all these capacities (noted by the WCD in 2000).[55]

Theme 2: Asia's emergence as a global leader in financing dams

China and Asia's high pace of dam construction has positioned Asia as a global centre of power technology manufacturing under licence and technology-transfer arrangements. At the same time, China has emerged as a major global financer of hydropower.

China also has a dominant role in international carbon finance markets that support hydropower and low-carbon strategies for the power sector.

- China has a 65 per cent share of global carbon finance for hydropower (73,387 megawatts by Feb 2013). Presently 70 per cent of the CDM's large hydropower projects have been awarded in China. Equally China has become the world's largest recipient of carbon credits for grid-connected wind energy.[56]
- China has a 45 per cent share of global hydropower. The installed capacity of hydropower in China is projected to grow by 38 per cent to 2030 (IEA).[57]

55. A recent review by the Independent Evaluation Group (IEG) of the World Bank Group found that only 60 per cent of all projects supported by the WB globally (not just dams) rated satisfactory or better in meeting WB safeguards; only 40 per cent in Africa (Independent Evaluation Group, 2010).
56. Data from IRN/WWF monitoring of the CDM (International Rivers, 2013) and discussion in Chinafolio (2012). Wind energy data from the CDM (UNEP Risoe, 2014).
57. IHA forecasts a 34 per cent increase in installed hydropower capacity in China from 2011-2020. The International Energy Agency's *World Energy Outlook* (IEA, 2013a) forecasts 33 per cent of global hydropower investment from China up to 2035. See also IEA Fact Sheet (IEA, 2013b).

- China is the largest single financer of the hydropower sector in Asia and Africa (and globally).
- China is now establishing its own pilot carbon markets and trading systems. It is likely the carbon trading will apply to China's domestic hydropower. It may eventually cover Chinese support for hydropower in other developing countries.[58]

Media reports suggest the new leadership in China (in 2013) called for more dams domestically, as part of the green energy push (Stanway, 2012).

Box 14. China's lending increases

US officials estimate that China's Exim Bank accounts for more than the total export financing of the Group of Seven industrialised nations combined. *The Financial Times* estimates that in 2009 and 2010, the China Exim bank and China Development Bank (CDB) together signed loans of at least $110 billion to other developing country governments and companies, more than the World Bank over a similar period ($104 billion).

Source: *Financial Times* Research Unit (FT.com, 2011).

Most significantly for this review is the fact China has emerged as the largest single international financer of hydropower in the past few years. China's Export-Import Bank (Exim Bank) is one of three major banks for state-backed policy loans and the sole provider of Chinese government concessional loans. While it does not publish figures for overseas loans, independent estimates suggest these banks eclipsed official lending of all EU EXIM banks (combined in all sectors) and surpassed the World Bank in lending to developing countries in 2009 (see Box 14) (Dyer *et al*., 2011; FT.com, 2011).

As the current market leader in financing hydropower, China is engaging closely with countries in Asia and Africa on new projects. This has implications for environmental and social standards applied and to some extent carbon finance. China is not a member of the OECD and operates outside the export credit rules agreed by OECD countries. China's Exim Bank is also not a member of the Equator Principles (EPs).

There are increasing signs that Chinese companies are aware of and sensitive to their impacts overseas. There are also regular indications that China's Exim Bank has its own internal safeguards in the pipeline to mitigate reputational risk. If and when these emerge, it would be a significant shift away from current policy of relying mainly on respecting the national regulations and laws of the beneficiary country, notwithstanding the weak institutional capacity and lack of resources in many countries to apply and monitor even their own standards.

58. As noted in Section 2.2, Guangdong province is reportedly is set to open the second-biggest carbon trading system in the world after the EU-ETS. Major Chinese cities like Shenzhen, Shanghai and Beijing reportedly have also established carbon trading systems. What is relevant to this review is it may be anticipated that China's carbon financing will apply to hydropower schemes where ECAs from the OECD consider support for companies that compete.

While much attention is focused on Chinese investment and trade in other parts of Asia and in Africa, a similar story is unfolding in Latin America. China is expected to become the second biggest trading partner with Latin America by 2014, overtaking the European Union. A recent report published by the IIED says sustainability issues are increasingly on the agenda in trade and investment relations between China and Latin America, and that Chinese companies are showing signs of learning from the previous mistakes in international investments (Blackmore *et al*., 2013). The IIED report examines Chinese trade and investment in mining, agriculture and forestry in Chile, Brazil and Peru and how complex interactions between regulations, shareholder and investor demands, consumer preferences, and civil society pressures are shaping these new relationships.

When considering safeguards for hydropower, it will be helpful to understand what safeguards China will require in international hydropower projects it supports in future. In addition, it would be helpful to identify opportunities to strengthen existing co-operation between China and EU member states to advance dam safeguards, share experience with hydropower in the respective carbon trading systems, and assess the potential role of large hydropower (with significant reservoirs) in climate adaptation strategies, in particular with existing large dams.[59]

Theme 3: The globalisation and diversification of dam financing

Regulatory reform, shifts to private-sector financing and global trends in the diversification of financing for large hydropower all influence environmental and social standards, and the incentives to evolve practices – whether to accept lower standards or move to higher ones.

Public and private electricity utilities in OECD countries generally finance investments in new or replacement generation capacity (whether wind, hydro or thermal) through a combination of utility corporate finance (based on electricity tariffs) and borrowing on domestic or international money markets, particularly bond issues. Similarly, developing countries with creditworthy utilities and independent power producers (IPPs) may access finance from international markets on commercial terms. Only national environmental and social standards generally apply to such projects.

Due to a combination of factors, other developing countries must turn to international public sector financing sources. Export credit agency (ECA) concessionary support maybe a first consideration. Generally, ECA support is below 30 per cent of project cost, with equity providing perhaps another 20-30 per cent, which leaves a large financing gap for governments. For less creditworthy countries, the only way to fill the gap is through other forms of concessionary funding requested from multilateral and bilateral funding agencies. In this respect,

59. Where potential exists to modify the operation of existing large dams with significant reservoirs (i) to mitigate flood and drought conditions amplified by climate change, or (ii) to reduce already adverse impacts that existing dams have in river basins now under water stress, which climate change may exacerbate.

the World Bank is referred to as the 'lender of last resort'. It is perceived to have the most stringent environment and social safeguards to access grants, loans or credit guarantees (or some mix of these depending on the country's status).[60]

For large hydropower schemes supported by multilaterals and OECD countries, the broader trend is towards a financing consortium approach. Typically there will be a mix of international financing partners each with different safeguards that need to be observed.

To illustrate, the proposed Lom Pangar Hydropower Project (Cameroon) has multilateral financial support from the AfDB and World Bank, as well as several bilateral and commercial bank sources (see Box 15). The Nam Theun 2 (NT2) hydropower project, which started commercial operation in Laos in 2010 and exports 95 per cent of its output to regional power markets such as Thailand, was financed by a consortium of 26 international and regional financial entities (see Box 16).

Box 15. Financing for the Lom Pangar Hydropower Project (Cameroon)

BORROWER/RECIPIENT (Govt Cameroon)	$98 million
BORROWER/RECIPIENT Pre-financing for associated infrastructure*	$101 million
International Development Association (IDA)	$132 million
African Development Bank	$29 million
Central African States Development Bank	$15 million
EC: European Investment Bank	$40 million
FRANCE: French Agency for Development	$79 million
Total Financing	$494 million

* The GOC will pre-finance the works for the adaptation of the Chad Cameroon pipeline.
Source: World Bank (2012).

Box 16. Financing the Nam Theun 2 Hydropower scheme in Laos

26 financial institutions involved:

- 4 multilateral development banks (World Bank Group, the Asian Development Bank (ADB), the European Investment Bank (EIB) and the Nordic Investment Bank).
- 3 export credit agencies (Coface of France, EKN of Sweden and GIEK of Norway).
- 3 bilateral financing agencies (French Development Agency, PROPARCO and the Export-Import Bank of Thailand).
- 9 international commercial banks providing finance in hard currencies (grouped together in a 'lead arrangers group' including BNP Paribas, Crédit Agricole Indosuez, ANZ from Australia, Société Générale, Fortis Bank and Bank of Tokyo-Mitsubishi).
- 7 Thai commercial banks providing finance in Thai Baht.

Source: NTPC (2014).

60. In the UK as in other OECD countries the lender of last resort is a country's central bank. The World Bank is considered the lender of last resort for developing countries. Only low-income developing countries can access grants from the World Bank Group.

In respect of the environmental and social standards applied:

- Both examples illustrate how a mix of standards and conditionalities would need to be evaluated in an international financial consortium.
- The 'highest' environmental criteria and standards of the financers involved are applied; in most cases this would be the World Bank's safeguard and inspection regimes.
- When it is involved, the World Bank tends to be lead donor, working with the recipient country (negotiating as necessary) on steps to meet safeguards, while the other financing partners (bilateral partners, ECAs, EPFIs and FIs) provide support.

Some financial institutions and companies are concerned about their involvement in dam projects bringing reputational, project, market or sovereign risk. They see advantages in only participating in such projects as part of a consortium that a multilateral financial institution like the World Bank leads.[61]

The trend towards consortium financing also raise questions about which standards are 'higher', and how that is decided – for example, whether compliance with the 2012 OECD Council's recommendation to apply the WCD and HSAP would be seen or interpreted as a 'higher' standard than the World Bank safeguard regime or not.

Another trend is the increasing diversification (and also complexity) of financial instruments. A dam project is often a multi-billion dollar investment and typically today it would be financed through a mix of grants, commercial and concessionary loans of different maturities, various forms of risk guarantees, equity participation and potentially innovative financing such as carbon financing.[62]

The trend is increasingly apparent with IPPs projects. External commercial borrowing (ECB) in Asia, for example, now includes Asian regional funds and syndicated loans with insurance companies and pension funds. Box 17 illustrates the growing range of new financial instruments available for hydropower in the Indian power sector (Hydro Power Blog, 2010).

Other mechanisms to finance hydropower that have received consideration are:

- country-specific power development funds
- merchant bank models, where projects are wholly financed by a developer and sold (refinanced) on commissioning.

61. This has potential implications for the type of environment and social standards applied on projects (e.g. whether national standards only apply). Analysis in Chapter 2 also suggests that relatively few dams are directly subject to World Bank safeguards, and only around 10-15 per cent of new hydropower dams around the world are covered by dam-specific international environmental and social safeguard processes (e.g. MFI, EU Linking Directive, CDM, OECD/ECA policies).

62. Some of these mechanisms (e.g. credit guarantees) are used in developing countries to attract commercial finance by covering risks that international financial markets are not prepared to absorb. Some argue that they can also help establish credit ratings and confidence for future arrangements.

National power development funds, or regional variations of such funds on shared river basins, are a new potential entry point for carbon financing. They offer a potential opportunity to introduce environmental and social safeguards at the project screening stage, i.e. as a condition for projects to access the fund, or to use the fund to improve monitoring, compliance and implementation of safeguards.[63]

Box 17. Sources of financing for hydropower suggested in India

Multilateral institutions: Institutions like the World Bank, the IFC, ADB, and Commonwealth Development Corporation (CDC) have traditionally financed infrastructure in developing countries. Funding comes with restrictive covenants, affordable cost and long tenure (seven years or more). The co-financing facility extended by some of the multilateral institutions is gaining popularity. Many of these loans require sovereign guarantees.

Export credit agencies (ECAs): ECAs are important sources of bilateral funding. Credit is provided by ECAs such as US Export-Import (Exim) bank, Exim Japan, Overseas Private Investment Corporation (OPIC-USA), Export Credits Guarantee Department (ECGD-UK), etc. They have a long history of providing finance for all types of power generating equipment. There are certain limitations to ECA financing such as exposure limit, exchange risk transfers to the IPP, guarantee requirements and the cost of insurance.

External commercial borrowing (ECB): These include Yankee Bonds (bank or corporate issue bonds), Samurai Bonds, Dragon Bonds (fixed income security), Euro currency syndicated loans, UD 144A Private placement, Global registered notes (GRNs), Global Bonds, and Medium Term notes programme (MTNs).

Syndicated loans: The special features of syndicated loans are that they are available for a medium to longer period; they are specific to the requirements of the borrowers to suit their projects, and offer a floating rate of interest. Most of the investors are Asian/European banks, FIs, insurance companies and pension funds.

Private placement: Rule 144A allows for private placement of bets to financial institutions known as qualified institutional buyers (QIBs), without the kind of stringent disclosure requirements needed for equity issues. Long tenure of bonds and less restrictive covenants make them conducive for financing power projects.

Global depository receipts (GDRs): GDRs present an attractive avenue of funds for Indian companies. Companies can collect a large volume of funds in foreign currency through Euro issues. GDRs are usually listed in Luxembourg and traded in London in the over-the-counter market or among a restricted group such as qualified institutional buyers (QIBs) in the USA. The GDRs do not have voting rights, so there is no fear of loss of management control.

Source: Hydro Power Blog (2010).

Perhaps one of the most significant financing trends is the way China has recently become the single largest financer of hydropower schemes worldwide (see Theme 2). While hard data is limited, it is clear the Export-Import Bank of China, in combination with other financial institutions, offers a full range of export and import credit guarantees for international hydropower that involves Chinese developers, utilities and equipment suppliers, as well as loans to overseas construction contracts and projects, and currency risk instruments.

63. The Nepal Power Development Fund was under preparation by the World Bank and HMG Nepal in the late 1990s, when it was cancelled due to political strife (World Bank, 2003c; USAID, 1998). Thailand has a Power Development Fund, not aimed at hydropower (ERC, 2014). A regional development fund has been mooted in the Mekong for Sector and Basin Strategic EAs, where all hydropower projects may contributed to a fund which could be used to help implement MRC procedures. Such considerations would in theory closely align to the WCD aspiration to improve strategic assessments and comprehensive options assessments.

Theme 4: Low-carbon and renewable energy policies for the power sector

Chapter 2 notes that electricity generation represents over one-third of man-made emissions globally and this is projected to grow to 40 per cent by 2030 with current trends. Thus the power sector is regarded as an important aspect of climate change policy in many countries, where renewable energy and 'green energy' strategies often link to hydropower policy and planning. Also there may be potential for hydropower to complement other intermittent renewable energy generation (wind, solar, ocean, etc.) to advance low-carbon power sector strategies overall, and otherwise reduce the carbon intensity of the power sector.

The UK's own national energy policy is to meet its EU renewable energy generation targets (20 per cent by 2020) and take steps to put the UK on a path to cut CO_2 emissions by some 60 per cent by 2050, with real progress by 2020. The UK Energy White Paper cites the two main challenges as 'tackling climate change by reducing carbon dioxide emissions both within the UK and abroad; and ensuring secure, clean and affordable energy as we become increasingly dependent on imported fuel' (DTI, 2007, p. 6).[64]

Similarly, developing countries are investing in 'green energy' strategies to address long-term energy challenges and also enhance access to international finance. In many countries, 'green energy' policies now embody targets for a percentage of the generation mix to come from renewable sources, such as 10 or 20 per cent. Some countries have set 'minimum portfolio' standards for specific indigenous renewable energy sources, such as hydropower or wind.

There are conflicting views on the potential role that hydropower should play in advancing low-carbon energy futures in developing counties. These may not necessarily be evidence based, but rather follow the normal fault lines in the ideological debate on large dams.

It is clear nonetheless that:

- National governments in countries such as China and Brazil use green energy policy as justification to approve or advance existing or stalled plans for hydropower development, or to argue the benefits of the import of hydropower from neighbouring countries such as Thailand.
- Equally, many national and international NGOs concerned about the environment and social impacts of hydropower argue that scaling up hydropower is counter-productive in all respects, and discount the synergies between hydropower and intermittent renewables as part of a low-carbon strategy.
- These considerations come at a time when hydropower and safeguard policies are controversial, as seen in the reaction to the World Bank paper *Directions in Hydropower* (World Bank, 2009) and the counter positions presented by many

64. At present about 15 per cent of generation in the UK is renewable energy. EU leaders reached agreement in principle in March 2007 that by 2020, 20 per cent of the bloc's final energy consumption should be produced from renewable energy sources as part of its drive to cut emissions of carbon dioxide. Renewables account for less than 7 per cent of the EU power sector supply mix (UK Government, 2009).

international NGOs as captured by the Bretton Woods Project critique (Bretton Woods Project, 2009).

Hydropower and carbon financing

This review has covered the question of 'how high to set the bar' on environmental and social standards and possible trade-offs with carbon outcomes. Chapter 6 explored the merits of targeting overall carbon support and the basis for the 20 megawatt threshold, the debate concerning GHG emissions of reservoirs (see Section 6.1), and the status of hydropower in CDM compliance markets.[65]

Other issues, either emerging or on the horizon include:

- The existence of well-documented rival visions of CDM additionality as regards hydropower, namely, the environmentally based and project-based versions,[66] the outcome of which may influence the consideration of hydropower in international carbon financing (CDM Rulebook, 2014).
- Whether carbon credits from hydropower should be solely owned by project developers, or government, or whether this should be a negotiated outcome. Existing or potential future carbon credits could be assigned to a basin, national or regional fund during the negotiation of a project concession agreements (especially on IPP projects). Agreements could also potentially specify the use of the funds generated to reinforce safeguards and related capacity to implement them and monitor their effectiveness over time engaging all stakeholders appropriately.
- Whether national and regional environmental and social criteria are aligned in shared river basins that have existing or proposed hydropower, and whether it would be practical to extend the influence of WCD-inspired tools to encompass these issues.

Broadly, it is helpful to apply comprehensive options assessments thinking (in line with WCD guidance) to any climate change mitigation and adaptation assessments that link the power sector. This recognises that the power sector to date has represented perhaps well over half of the carbon financing credits issued globally (see Section 6.2).

This may include, for example, considering the explicit consideration of (i) assessment of synergies among the various low-carbon options, in particular the

65. The international debate and actual science on assessing reservoir emissions have progressed considerably since 2000, when the WCD provided a review of the situation and kicked off a more intense debate on the topic. Today there is a much clearer, if not agreed, picture of where scientific uncertainty on GHG emissions from reservoirs remains. Moreover, CDM methodologies exist to calculate carbon offsets where hydropower displaces fossil fuel generation in power systems (see Section 6.1). The watts per metre threshold under the CDM which was developed to focus on non-controversial hydropower projects (in terms of potential reservoir emissions) has had the effect of steering CDM carbon support towards run-of-river hydropower with small reservoirs. The latest CDM data show that 72 per cent of all successful hydropower CDM applications are run-of-river (see Section 6.1).

66. This impacts on which projects are eligible to receive carbon financing. In the former interpretation, a project is additional if the GHG emissions afforded by the scheme are lower than the general baseline without the project. In the latter, which is sometimes termed 'project additionality,' the scheme would not have happened without numerous barrier-checks and CDM validation, which is the common approach. See also Haya and Parekh (2011), which discusses some alternatives.

sort of hydropower appropriate to complement intermittent renewable sources; (ii) modifying the operation of existing water infrastructure to reinforce flood and drought measures (in particular, large hydropower with seasonal or multi-annual storage reservoirs where they already exist); and (iii) allowing flexibility in national decisions to stipulate who may own existing or potential future carbon credits that are attached to hydropower schemes which offset thermal power generation (e.g. are they owned by private developers, the government or the basin-local community stakeholders, or some mix) and how financial flows (derived from hydropower carbon financing) may best be applied to improve sustainability and safeguards.

Theme 5: Shifts in global public attitudes

Although they can pull in different directions, public attitudes also help to shape government investment decisions in the power sector, and the nature of environmental and social standards a country adopts. In a wider sense, many evolving public attitudes come into play in influencing how societies prioritise and choose among the various context-specific options available to meet electricity needs, as noted at the start of this Annex.

These public attitudes and pressure help to shape hydropower directions not only in OECD countries, but also increasingly all developing countries and different governance settings.

Some relevant trends have had an impact on the outlook for hydropower investment and related safeguards:

- Japan's tsunami and its nuclear aftermath had clear and immediate impacts on public attitudes towards nuclear power as illustrated in consequent European government decisions to scale back on new nuclear power plans, or to accelerate the decommissioning of existing nuclear power stations (e.g. in Germany and Italy). Japan's experience has also affected public attitudes in developing countries considering civil nuclear power as an option.[67]
- There is a progression toward more openness and participatory dialogue in applying environment and social standards in most developing countries. For example, the situation in the Mekong is vastly different from ten years ago, as evidenced by international and local NGOs now being engaged in strategic dialogue processes under way in the Mekong on hydropower and national and regional environment and social standards.[68]
- Public attitudes and pressure are broadly moving in one direction: to improve environmental and social standards. Many advocacy groups from the local to international level mobilise for or against specific hydropower proposals (facilitated by today's social media and information technology) and public donations to international NGOs (INGOs) reflect underlying public support.

67. The impact on the growth of nuclear generating capacity will become fully clear only in the coming years. A majority of countries have confirmed their construction plans (including China, the Emirates, France, Poland, the United Kingdom and the United States) while others (essentially Germany and Italy) have decided to eventually phase out nuclear power or to abandon their nuclear plant projects (IEA, 2014).
68. See the public consultation and stakeholder engagement in the MRC Strategic Environmental Assessment (SEA) of Mainstream Dams (MRC, 2010a).

- Shifts in public attitudes over the mode of financing for energy sector investments to some extent influence the options that governments consider in their power strategies – for instance, public or private-sector investment. There are also growing expectations that commercial banks, companies and corporations involved in hydropower should be held accountable for any violations in their stated corporate social responsibility policies.
- More recently public concerns over electricity tariffs (and year-on-year real increases affecting affordability) have been growing in many countries, including in OECD counties. This ultimately influences the options that governments consider, or choose to facilitate in regulatory systems (e.g. to favour with tax incentives or subsidy programmes, or to require power utilities to support). Consumers are also increasing looking for governments to offer consumer choice in which energy technologies they support when paying their electricity bills.

A broader shift in public attitudes over the past few decades in many, if not all, countries, has been growing public support for maximising the role that renewable energy sources and technologies play in the electricity supply mix, and to emphasise sustainable, affordable outcomes. Of course many competing views exist on how this is best done in the short and longer term. Countries' energy resources differ considerably in terms of both fossil fuels and renewable energy (including hydropower potential). As mentioned in Theme 4, the UK's own Energy White Paper (2007) cites 'tackling climate change by reducing carbon dioxide emissions both within the UK and abroad' as one of the two main challenges, which links to the question of the role of hydropower and other renewable energy sources and what standards to apply.

At the same time, there is little awareness among the general public of the sort of trade-offs that relate to gaining access to carbon financing, the implications for low-carbon futures, and setting the bar on environmental and social standard for hydropower and other energy supply options.

Who is applying what? Harmonising policies in one government

While this review has identified the harmonisation of different safeguards as a challenge for individual projects that have multiple funding sources, there is equally a need for policy coherence between different departments, particularly among the EU governments. This review does not go into this aspect in detail; however, it is worth noting the roles of different UK government departments as an example (see Table 15).

The UK's Export Credits Guarantee Department (ECGD) is constrained by OECD guidance referring to the HSAP and the WCD Strategic Priorities, while the Department of Energy and Climate Change (DECC) is constrained by the EU Linking Directive that refers to 'respect' for WCD criteria and guidelines (but not the WCD Strategic Priorities). It is difficult in these circumstances to articulate a common UK government position on large hydropower safeguards that encapsulates these slightly different obligations. Other EU countries may be confronted with similar challenges.

Table 15. Illustrative UK actor map regarding hydropower, carbon financing and support to developing countries

What agency	What role
Parliamentary Select Committee on International Development	Policy scrutiny of ODA and investigation of problems in UK support of dams, for example the Ilisu Dam (UK Parliament, 2000).
Export Credits Guarantee Department (ECDG)	Provides investors with guarantees against loss, taking into account the government's international policies (UK Export Finance, 2014).
Department of Energy and Climate Change (DECC)	International carbon markets: Designated National Authority (DNA) function for Clean Development Mechanism projects – assessing large hydro projects when determining whether to issue a Letter of Approval.
Department for International Development (DFID)	Government lead on international development policy and implementation including bilateral and multilateral programmes; oversight of the Commonwealth Development Corporation; joint management of the International Climate Fund with DECC and DEFRA.
Department for Food and Rural Affairs (DEFRA)	International waters.
Department of Trade and Industry and (DTI) and Department for Business, Innovation and Skills (BIS)	Industry policy; oversees the ECDG.
UK Foreign Office	Policy and liaison with countries and IFIs, UN, OECD and other bodies.

Table 16. Types of support the UK extends to hydropower and large dams

Direct and bilateral UK support	Indirect and multilateral support UK board member vote
1. Clean Development Mechanism – UK DNA 2. Export Credits Guarantee Department (ECGD) support (via BIS/DTI) 3. Grants and loans to countries via DFID or any other UK department or agency	1. Access to carbon emission funds – UK voting or facilitation role 2. IFI multilateral grant, loan, credit guaranties (Multilateral Investment Guarantee Agency (MIGA), World Bank) – regarding the UK voting role 3. IFI regional grant, loan, credit guarantees – UK voting role 4. UK voice in international standards bodies (e.g. Equator Principles) 5. UK trust funds in IFIs

Annex 2 Example of an HSAP topic – P1 Communication and Consultation (HSAP 2010a)

P-1 Communications and Consultation

This topic addresses the identification and engagement with project stakeholders, both within the company as well as between the company and external stakeholders (e.g. affected communities, governments, key institutions, partners, contractors, catchment residents, etc.). The intent is that stakeholders are identified and engaged in the issues of interest to them, and communication and consultation processes establish a foundation for good stakeholder relations throughout the project life.

Scoring

1 *There are significant gaps relative to basic good practice.*

2 *Most relevant elements of basic good practice have been undertaken, but there is one significant gap.*

3 **Assessment:** Stakeholder mapping has been undertaken to identify and analyse stakeholders, to establish those that are directly affected, and to establish communication requirements and priorities, with no significant gaps.

Management: Communications and consultation plans and processes, including an appropriate grievance mechanism, have been developed at an early stage applicable to project preparation, implementation and operation that outline communication and consultation needs and approaches for various stakeholder groups and topics.

Stakeholder Engagement: The project preparation stage has involved appropriately timed communications and engagement, often two-way, with directly affected stakeholders on topics of interest and relevance to them; engagement is undertaken in good faith; ongoing processes are in place for stakeholders to raise issues and get feedback.

Conformance/Compliance: Processes and objectives relating to communications and consultation have been and are on track to be met with no major non-compliances or non-conformances, and any communications-related commitments have been or are on track to be met.

4 *All relevant elements of basic good practice have been undertaken and in one or more cases exceeded, but there is one significant gap in the requirements for proven best practice.*

5 **Assessment:** In addition, the stakeholder mapping takes broad considerations into account.
Management: In addition, communication and consultation plans and processes show a high level of sensitivity to communication and consultation needs and approaches for various stakeholder groups and topics; and processes are in place to anticipate and respond to emerging risks and opportunities.
Stakeholder Engagement: In addition, engagement with directly affected stakeholders has been inclusive and participatory; negotiations are undertaken in good faith; and feedback on how issues raised have been taken into consideration has been thorough and timely.
Conformance/Compliance: In addition, there are no non-compliances or non-conformances.

Assessment guidance:

Stakeholders are those who are interested in, involved in or affected by the hydropower project and associated activities.

Stakeholder mapping refers to the identification and grouping of stakeholders in a meaningful way, for example based on stakeholder rights, risks and responsibilities. An example of 'rights' would be land rights.

Directly affected stakeholders are those stakeholders with substantial rights, risks and responsibilities in relation to the issues. These may be inside the project affected area (e.g. project affected communities) or outside the project-affected area (e.g. government regulators, finance institution representatives, or investment partners).

Grievance mechanisms refer to the process by which stakeholders are able to raise concerns, grievances and legitimate complaints, as well as the project procedures to track and respond to any grievances.

Needs and approaches for stakeholder groups could include consideration of: cultural norms, gender, literacy level, vulnerable social groups, disabilities, logistical constraints, etc.

Good faith engagement is engagement that is undertaken with an honest intent to reach a mutually satisfactory understanding on the issues of concern.

Broad considerations within stakeholder mapping could include, for example, the geographic or compositional extent of stakeholder groups identified and considered, the interrelationships amongst stakeholder groups, the level of vulnerability to adverse project impacts and risks, consideration of rights, risks and responsibilities, etc.

Processes to anticipate emerging risks and opportunities could include, for example, participation of project representatives in a catchment management committee.

Good faith negotiation involves (i) willingness to engage in a process; (ii) provision of information necessary for informed negotiation; (iii) exploration of key areas of importance; (iv) mutually acceptable procedures for negotiation; (v) willingness to modify position; (vi) provision of sufficient time to both parties for decision making; (vii) agreements on proposed compensation framework, mitigation measures, and development interventions.

Potential interviewees: project communications staff; project manager; stakeholder representatives; project-affected communities representatives.

Examples of evidence: project stakeholder mapping document; project communications and/or consultation plans; communications protocols; grievance mechanisms.

Annex 3 World Bank safeguards and the WCD

The broader policies and procedures governing World Bank operations are reflected in the Bank's operational directives (ODs). These are compiled in an online manual (World Bank 2013a). The ODs are gradually being reformatted into a three-tiered structure:

1. **policy:** operational policies (OPs) listing core requirements for bank operations
2. **procedures:** bank procedures (BPs) that bank staff must follow
3. **good practice:** good practice (GPs).

Safeguard policies: within the overall OD framework, there are ten key environmental and social policies with 65 supporting operational objectives to identify, avoid, and mitigate the potential negative environmental impacts of the bank's lending operations (defined by relevant OPs, BPs and GPs). These are known as the environmental and social safeguard policies. Each proposed project must be screened to determine which safeguard policies may be triggered. The borrower is then responsible for undertaking the assessments required by the safeguards, with general advice provided by bank staff.

The safeguard policies are also promoted as a platform for stakeholders to participate in the project design not only for hydropower projects but more generally, and also as an instrument for building ownership and mutually beneficial partnerships with local communities to design and implement the various environmental and social management components. Specific safeguard policies today address: environmental assessment, natural habitats, pest management, cultural property, involuntary resettlement, indigenous peoples, safety of dams, projects on international waterways and projects in disputed areas.

Disclosure policies: among other aspects, these policies detail (i) principles of information disclosure and transparency; (ii) exceptions to disclosure; and (iii) routine disclosure and request-driven disclosure. Disclosure is also linked to the World Bank's accountability policies, which establish minimum 'do no harm' protection for communities affected by its projects and programmes and provide the means for holding institutions accountable for actions at different stages of the project cycle.

Table 17. World Bank safeguard policy – general objectives

Safeguard	Objective
Environment Assessment (overarching)	An 'umbrella policy' through which potential social and environmental impacts are identified and mitigation measures proposed: To help ensure the environmental and social soundness and sustainability of investment projects. To support integration of environmental and social aspects of projects into the decision-making process.
Natural Habitats	To promote environmentally sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions.
Pest Management	To minimise and manage the environmental and health risks associated with pesticide use and promote and support safe, effective, and environmentally sound pest management.
Involuntary Resettlement	To avoid or minimise involuntary resettlement and, where this is not feasible, to assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.
Indigenous Peoples	To design and implement projects in a way that fosters full respect for indigenous peoples' dignity, human rights, and cultural uniqueness and so that they: (i) receive culturally compatible social and economic benefits; and (ii) do not suffer adverse effects during the development process.
Forests	To realise the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests.
Physical Cultural Resources (PCR)	To assist in preserving physical cultural resources and avoiding their destruction or damage. PCR includes resources of archaeological, paleontological, historical, architectural, religious (including graveyards and burial sites), aesthetic, or other cultural significance.
Safety of Dams	To assure quality and safety in the design and construction of new dams and the rehabilitation of existing dams, and in carrying out activities that may be affected by an existing dam.
Projects on International Waterways	To reduce potential conflict between states that border an international waterway (or a bay, gulf, etc.) over projects that may affect the use or pollute the waterway.
Projects in Disputed Areas	To avoid conflict this policy establishes minimal rules for World Bank financing of projects in areas disputed by two or more states.

Source: World Bank (2013b).

Table 18. Mapping of WCD Strategic Priorities and World Bank safeguard policies

World Bank environmental and social safeguard policies[69] Consists of 10 policy objectives and 65 operational principles (in brackets)	**WCD Strategic Priorities** Consists of 7 Strategic Priorities and 34 policy principles
1. Environmental assessment (over arching) (11) 2. Natural habitats (7) 3. Pest management (5) 4. Involuntary resettlement (12) 5. Indigenous peoples(9) 6. Forests (10) 7. Physical cultural resources (PCR) (5) 8. Safety of dams (6) 9. Projects on international waterways 10. Projects in disputed areas	1. Gaining public acceptance (4) 2. Comprehensive options assessment (5) 3. Addressing existing dams (5) 4. Sustaining rivers and livelihoods (5) 5. Recognising entitlements and sharing benefits (5) 6. Ensuring compliance (5) 7. Sharing rivers for peace, development and security (5)

As discussed in Chapter 5, there is limited one-to-one mapping of the 65 operating principles underpinning the 10 World Bank safeguard policies to the 34 policy principles underpinning the WCD's 7 Strategic Priorities. Table 19 illustrates details of the objectives and operational principles for two safeguards: environmental assessment and forests. Readers may refer to the World Bank's operational manual for details on all policies (World Bank, 2013a).

69. Note the numbers in brackets indicate the number of operational policies and policy principles, See World Bank (2014).

Table 19. Environmental and social safeguard policy objectives and operational principles

Objectives	Operational Principles
A. Environmental Assessment	
To help ensure the environmental and social soundness and sustainability of investment projects. To support integration of environmental and social aspects of projects into the decision making process.	1. Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment (EA) so that appropriate studies are undertaken proportional to potential risks and to direct and, as relevant, indirect, cumulative, and associated impacts. Use sectoral or regional environmental assessment when appropriate. 2. Assess potential impacts of the proposed project on physical, biological, socio-economic and physical cultural resources, including transboundary and global concerns, and potential impacts on human health and safety. 3. Assess the adequacy of the applicable legal and institutional framework, including applicable international environmental agreements, and confirm that they provide that the cooperating government does not finance project activities that would contravene such international obligations. 4. Provide for assessment of feasible investment, technical, and siting alternatives, including the "no action" alternative, potential impacts, feasibility of mitigating these impacts, their capital and recurrent costs, their suitability under local conditions, and their institutional, training and monitoring requirements associated with them. 5. Where applicable to the type of project being supported, normally apply the Pollution Prevention and Abatement Handbook (PPAH). Justify deviations when alternatives to measures set forth in the PPAH are selected. 6. Prevent and, where not possible to prevent, at least minimize, or compensate for adverse project impacts and enhance positive impacts through environmental management and planning that includes the proposed mitigation measures, monitoring, institutional capacity development and training measures, an implementation schedule, and cost estimates. 7. Involve stakeholders, including project-affected groups and local nongovernmental organizations, as early as possible, in the preparation process and ensure that their views and concerns are made known to decision makers and taken into account. Continue consultations throughout project implementation as necessary to address EA-related issues that affect them. 8. Use independent expertise in the preparation of EA where appropriate. Use independent advisory panels during preparation and implementation of projects that are highly risky or contentious or that involve serious and multi-dimensional environmental and/or social concerns. 9. Provide measures to link the environmental assessment process and findings with studies of economic, financial, institutional, social and technical analyses of a proposed project. 10. Provide for application of the principles in this table to sub-projects under investment and financial intermediary activities. 11. Disclose draft EA in a timely manner, before appraisal formally begins, in an accessible place and in a form and language understandable to key stakeholders.

Source: World Bank (2013a).

F. Forests	
To realise the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests.	1. Screen as early as possible for potential impacts on forest health and quality and on the rights and welfare of the people who depend on them. As appropriate, evaluate the prospects for new markets and marketing arrangements. 2. Do not finance projects that would involve significant conversion or degradation of critical forest areas or related critical natural habitats, or that would contravene applicable international environmental agreements. 3. Do not finance natural forest harvesting or plantation development that would involve any conversion or degradation of critical forest areas or related critical natural habitats. 4. Support projects that adversely impact non-critical natural forests or related natural habitats only if viable alternatives to the project are not available and only if appropriate conservation and mitigation measures are in place. 5. Support commercial, industrial-scale forest harvesting only when the operation is certified, under an independent forest certification system, as meeting, or having a time-bound action plan to meet, internationally recognized standards of responsible forest management and use. 6. Ensure that forest restoration projects maintain or enhance biodiversity and ecosystem functionality and that all plantation projects are environmentally appropriate, socially beneficial and economically viable. 7. Give preference to small-scale community-level management approaches where they best reduce poverty in a sustainable manner. 8. Support commercial harvesting by small-scale landholders, local communities or entities under joint forest management where monitoring with the meaningful participation of local communities demonstrates that these operations achieve a standard of forest management consistent with internationally recognized standards of responsible forest use or that they are adhering to an approved time-bound plan to meet these standards. 9. Use forest certification systems that require: (a) compliance with relevant laws; (b) recognition of, and respect for, legal or customary land tenure and use rights as well as the rights of Indigenous Peoples and workers; (c) measures to enhance sound community relations; (d) conservation of biological diversity and ecological functions; (e) measures to maintain or enhance environmentally sound multiple benefits from the forest; (f) prevention or minimization of environmental impacts; (g) effective forest management planning; (h) active monitoring and assessment of relevant forest management areas; and (i) independent, cost effective, third-party assessment of forest management performance against measurable performance standards defined at the national level and compatible with internationally accepted principles and criteria of sustainable forest management through decision making procedures that are fair, transparent, independent, designed to avoid conflict of interest and involve the meaningful participation of key stakeholders, including the private sector, Indigenous Peoples, and local communities. 10. Disclose any time-bound action plans in a timely manner, before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders.

Annex 4 River basin approaches

River basin perspective and sustainable development

Looking at the entire river basin is important from the integrated water resource management perspective in sustainable development as well as from the carbon perspective. Since the Dublin Principles for Integrated Water Resources Management were developed in the early 1990s (ICWE, 1992), considerable effort has been placed in linking dam planning and management to the river basin level, such as the approaches embodied in the European Water Framework Directive (EU, 2000), the RAMSAR Convention and Guidance, and the Strategic Priorities of the WCD (2000).

The World Bank Group notes that, '[a]s a corollary to regionalization of energy systems, water management is increasingly focused at the river basin level, regardless of national borders. A regional development approach addresses both upstream and downstream riparian needs, expanding the scope and benefits of water management beyond physical distribution of water and setting a foundation for regional cooperation' (World Bank Group, 2009).

Africa, in particular, is addressing the political reality of its multiple states, markets and natural resources and is increasingly interested in moving hydropower and water infrastructure investments from its national to its regional agendas. Water management also has broader water security implications in many parts of the world which translate to food security. The potential of regional hydropower as a tool for regional co-operation and development is an increasingly important dimension of value.

Guidance and implementation

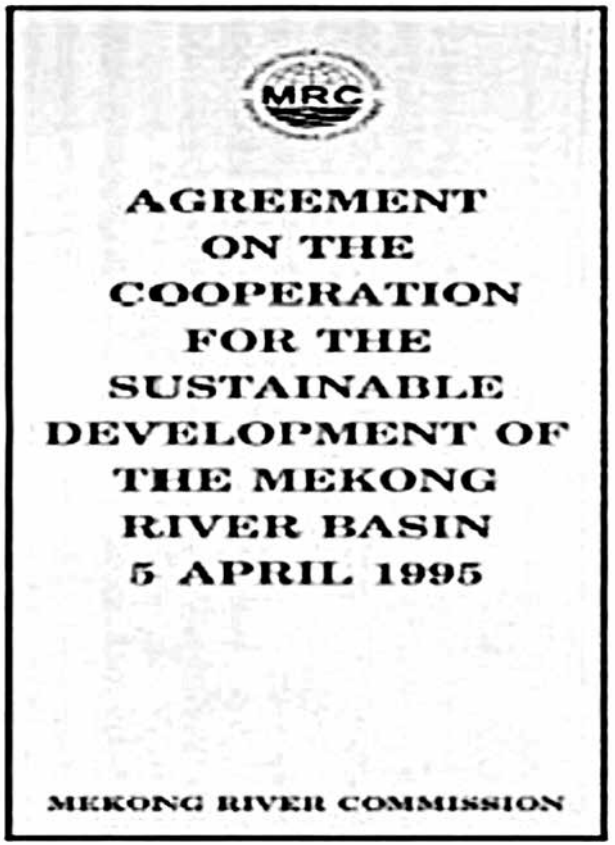
Recent work in the Mekong region illustrates how such guidance might be put into practice. Here, the sustainability challenge is linking the 1995 Mekong Agreement for co-operation on sustainable development of the Mekong River Basin (MRC, 1995) with the regulatory frameworks for hydropower that have recently evolved in the respective Mekong countries.

This challenge is illustrated in Figure 17, taken from the Mekong River Commission *Initiative on Sustainable Hydropower* (MRC, 2010c), merging the 'two worlds' of IWRM river-basin planning and management on the one hand, and power sector regulation on the other, where many of the criteria and guidelines have legal effect. It recognises that hydropower decisions in the past have largely been made by power sector authorities with little regard to the concerns of the agencies responsible for water resource management – a situation that is not unique to the Mekong region.

In keeping with this general thrust, the Mekong countries have developed tools and guidelines adapted for the Mekong regional context, under the auspices of the Mekong River Commission, drawing on a range of existing sources and identifying new approaches inspired by the WCD and HSA Protocol.

Figure 17. Integrating planning/regulation in the water and power sectors to achieve sustainable outcomes with hydropower and dams

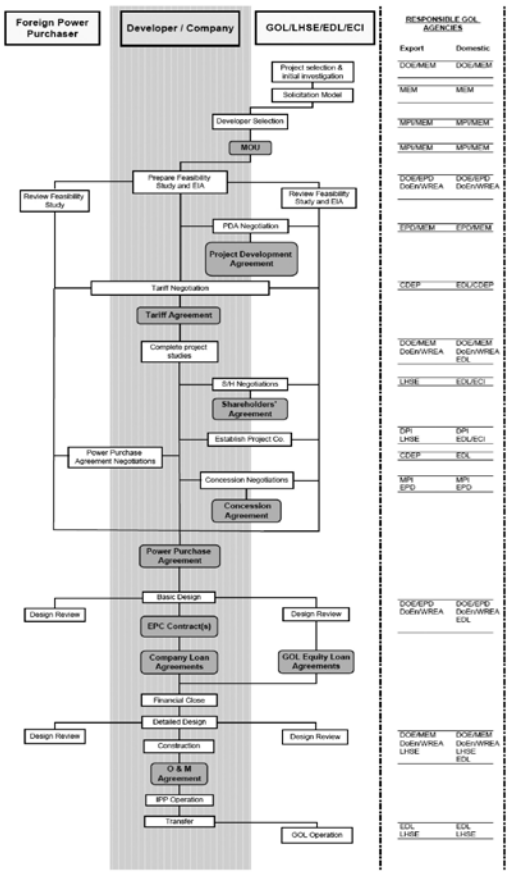
For River Basin Cooperation
(Melong river basin agreement)



Wider Challenge: in Practice

Mechanisms to better integrate 'two world' planning/regulation, procedural and decision frameworks

For Power Sector Regulation
(power sector regulation)



Source: MRC (2010c).

One example is the Rapid Sustainability Assessment Tool (RSAT) that was explicitly inspired by the WCD and HSAP process. It was developed by a partnership of the Asian Development Bank, Mekong River Commission and WWF. The RSAT looks at the sustainability of hydropower in a river basin context, with either single or multiple hydropower projects that are existing, planned, or a mix thereof. The voluntary tool was developed in close co-operation with the International Hydropower Association's Forum that was working on the HSAP at the time.

The MRC took the view that the HSAP (and earlier IHA versions in 2004 and 2006) was appropriate to measure the sustainability of individual hydropower projects, while the RSAT was a tool that could flexibly assess the sustainability of single and multiple hydropower projects in the river basin context. As noted on the MRC website, RSAT was seen as a 'breakthrough in sustainable hydropower development has been made with the launch of an innovative new assessment tool that helps identify the most sustainable sites, designs and operation rules for hydropower development (MRC, 2011a). These new tools can complement the WCD and HSAP.

Transboundary dimensions

Regional-level consideration of hydropower and its associated carbon issues is increasingly important. Where there are strong processes, the resulting regional agreements and policies may even supersede global guidance.

Using the Mekong example again, in 2009 the four MRC member countries (Cambodia, Laos, Thailand and Viet Nam) – with China and Myanmar as observers and official dialogue partners – reached an agreement on the Preliminary Design Guidance (PDG) for mainstream hydropower proposals in the lower Mekong in 2009 (MRC, 2009). The PDG explicitly states it was inspired by the WCD. According to the MRC website, '... the Preliminary Design Guidance provides a transboundary and international best practice approach to designing mainstream Mekong hydropower schemes' (MRC, 2009). As the media reaction shows, potential mainstream development in the lower Mekong is highly controversial. Nevertheless, the PDG became the basis for the MRC Procedures for Prior Notification and Prior Consultation (PNPCA) for consideration of transboundary projects such as the Xayaburi Project in Laos (MRC, 2011c).

Mekong countries also undertook a strategic environmental assessment (SEA) of the proposed Mekong mainstream hydropower schemes. A separate programme of SEAs are being undertaken for river basins with hydropower potential. The strategic tools inspired by the WCD have thus provided highly informative inputs for national governments and the international community in reaching decisions on Mekong hydropower. Nevertheless, the final decisions rest with the respective Mekong governments as project financing for most of the proposed lower Mekong basin mainstream projects comes either from power sector entities from China, or regional FIs which are not bound by the Equator Principles.

Annex 5 Review of EU template for WCD compliance under CDM

This annex reviews the EU template[70] for assessing project compliance with the principles of the WCD. It is confined to the WCD Strategic Priorities, although the EU Linking Directive also requires respect for the criteria and guidelines. It presents each strategic priority, followed by the questions taken directly from the EU template for applications. The wording and intent of each section is analysed to see whether the template allows effective assessment against WCD priorities.

WCD Strategic Priority 1: Gaining Public Acceptance

Key message

Public acceptance of key decisions is essential for equitable and sustainable water and energy resources development. Acceptance emerges from recognising rights, addressing risks, and safeguarding the entitlements of all groups of affected people, particularly indigenous and tribal peoples, women and other vulnerable groups. Decision-making processes and mechanisms are used that enable informed participation by all groups of people, and result in the demonstrable acceptance of key decisions. Where projects affect indigenous and tribal peoples, such processes are guided by their free, prior and informed consent.

Effective implementation of this strategic priority depends on applying these policy principles:

1.1 Recognition of rights and assessments of risks are the basis for the identification and inclusion of stakeholders in decision-making on energy and water resources development.

1.2 Access to information, legal and other support is available to all stakeholders, particularly indigenous and tribal peoples, women and other vulnerable groups, to enable their informed participation in decision-making processes.

1.3 Demonstrable public acceptance of all key decisions is achieved through agreements negotiated in an open and transparent process conducted in good faith and with the informed participation of all stakeholders.

1.4 Decisions on projects affecting indigenous and tribal peoples are guided by their free, prior and informed consent achieved through formal and informal representative bodies.

70. See DECC (2011), p. 29.

EU Template: Section 1 Gaining Public Acceptance

Template wording:
Please complete this form with full explanations for all items. If a criterion is not relevant to the project, please explain why.

CRITERIA

1. Gaining Public Acceptance: Description Sources Validator's Assessment

1.1 Stakeholder consultation[71]

1. Describe how the relevant stakeholders were identified.

2. Are any of these people minority groups, especially indigenous people and if so, what special efforts were taken to identify and meet their needs?

3. How many people have to be resettled due to the project?

4. Resettled people/annual energy production (number/GWh).

5. How many people were otherwise affected by the project (e.g. through loss of land, reduced productivity of fishing or hunting, etc.)?

6. Describe how the affected local people and other relevant stakeholders have been informed and involved in the decision-making process of building the power plant.

7. Describe how the affected local people and relevant stakeholders have been informed about the impacts of the project on their quality of life.

8. How have the affected local and indigenous communities participated in the decision-making process?

9. How will the economic and social impacts of the project on the affected local communities, indigenous people and/or other relevant stakeholders be addressed?

10. How do compensation and benefit agreements correspond with the identified needs and rights of the stakeholders negatively affected upstream and downstream due to the project?

11. Was a Stakeholders Forum held with a broad local community participation (based on a customary and national law)? Describe the process and its outcome, and the response of project developer, local and national authorities?

1.2 Transparency.

1. Was key project documentation (e.g. social and environmental impact assessments) made publicly available before a decision to start construction was made?

2. In what form was project documentation made available to stakeholders? Was it the original EIA etc. or was it in another form e.g. a summary of positive and negative effects of the hydrological construction.

71. Such as process documentation, stakeholders and issues identification, consultation strategies, resources planning, compensation plans, timetables, information sharing, written agreements with stakeholders, records of interviews, results of surveys/polls, minutes of meetings of the Stakeholders Forum, project documentation, environmental impact assessments, documents related to local spatial planning, government and local authorities permits and agreements, description of methodologies used, decommissioning plans (where appropriate), other related environmental impact and social impact studies, etc.

Wording analysis

The Intention of the WCD was to put affected communities at the heart of the decision-making process. They were to be identified and actively involved in addressing the risks facing their communities, according to a rights-based framework and in an informed manner.

The provisions of the template are a much watered down version of that conception. Here, the EU template criteria still see communities as predominantly passive actors to be informed and compensated.

While some of the questions assume the implicit existence of agreements or negotiated outcomes, eight out 11 questions adopt a descriptive approach (either 'how' or 'describe'…) that lacks a clear assessment scale. This makes it hard to see the degree to which 'respect' of WCD can be assessed.

Especially notable by their absence, or reformulation, are some of the key concepts articulated by the WCD. Table 20 compares the relevant wording.

Table 20. Key WCD concepts and their EU template equivalent

WCD wording	EU template wording
Public acceptance	Community information and consultation
Recognising rights	Do compensation and benefit agreements correspond with identified rights?
Addressing risks	No mention
Safeguarding entitlements	No mention
Free, prior and informed consent for tribal and indigenous peoples	What special efforts have been made to meet their needs?
Demonstrable public acceptance	Consultation and participation (no reference to acceptance or anything 'demonstrable')
Negotiation	No mention

WCD Strategic Priority 2: Comprehensive Options Assessment

Key message

Alternatives to dams do often exist. To explore these alternatives, needs for water, food and energy are assessed and objectives clearly defined. The appropriate development response is identified from a range of possible options. The selection is based on a comprehensive and participatory assessment of the full range of policy, institutional, and technical options. In the assessment process social and environmental aspects have the same significance as economic and financial factors. The options assessment process continues through all stages of planning, project development and operations.

Effective implementation of this strategic priority depends on applying these policy principles:

2.1 Development needs and objectives are clearly formulated through an open and participatory process before the identification and assessment of options for water and energy resource development.

2.2 Planning approaches that take into account the full range of development objectives are used to assess all policy, institutional, management, and technical options before the decision is made to proceed with any programme or project.

2.3 Social and environmental aspects are given the same significance and technical, economic and financial factors in assessing options.

2.4 Increasing the effectiveness and sustainability of existing water, irrigation, and energy systems are given priority in the options assessment process.

2.5 If a dam is selected through such a comprehensive options assessment process, social and environmental principles are applied in the review and selection of options throughout the detailed planning, design, construction and operational phases.

EU Template: Section 2 Comprehensive Options Assessment

Template wording:

2.1 Needs

1. What priority is given to hydropower in national development or energy planning (e.g., relevant government decisions)?
2. What are the needs for hydropower at regional and local level?
3. What are the regional/national supply needs of the electric system (renewable base load, peak load or load balancing of the grid, support of intermittent renewables)?
4. Describe safeguards for equitable access to water resources. How do hydropower projects contribute to efficient water resources management?
5. Does this hydropower project provide financial incentives to develop a multipurpose project?

2.2 Alternatives

1. Describe the examination of alternatives to the project that have been considered (include details of feasibility studies and do-nothing options analysis that have been conducted).
2. Have stakeholders been involved in the identification of the options? Describe process and outcome of that involvement.
3. What are the main reasons behind the project choice and site selection (social, environmental, economic, and technical)?
4. What are the consequences of non-action for the local and global environment?
5. On the project assessment level, describe project variants and types of technology considered in comparison with the selected option.

Wording analysis

The intention of the WCD is to promote an open and transparent process for looking at the range of options available for meeting development needs, of which large dams are just one. In this sense the WCD suggests that the process starts pretty much with a blank sheet of paper entitled, 'What do we need?'. The issue of how to then get what we need (technology options and choices) is a second step.

From the first question, the EU template begins with the explicit assumption of the hydropower option, which has a certain logic as the template is restricted to energy projects. While Question 3 begins to look at needs, this is expressed purely as the needs of the electricity grid, not the basic needs for development. Question 3 again asks a 'how?' question without any normative standard. Questions 4 and 5 bear no real relation to the WCD Strategic Priority 2.

The WCD recommendations on options assessment should really be delivered by the national planning authorities, and it could be argued that individual project developers will become involved only once this process is complete, so they cannot be held responsible for it.

WCD Strategic Priority 3: Addressing Existing Dams

Key message

Opportunities exist to optimise benefits from many existing dams, address outstanding social issues and strengthen environmental mitigation and restoration measures. Dams and the context in which they operate are not seen as static over time. Benefits and impacts may be transformed by changes in water use priorities, physical and land use changes in the river basin, technological developments, and changes in public policy expressed in environment, safety, economic and technical regulations. Management and operation practices must adapt continuously to changing circumstances over the project's life and must address outstanding social issues.

Effective implementation of this strategic priority depends on applying these policy principles:

3.1 A comprehensive post-project monitoring and evaluation process, and a system of longer-term periodic reviews of the performance, benefits, and impacts for all existing large dams are introduced.

3.2 Programmes to restore, improve and optimise benefits from existing large dams are identified and implemented. Options to consider include rehabilitate, modernise and upgrade equipment and facilities, optimise reservoir operations and introduce non-structural measures to improve the efficiency of delivery and use of services.

3.3 Outstanding social issues associated with existing large dams are identifies and assessed; processes and mechanisms are developed with affected communities to remedy them.

3.4 The effectiveness of existing environmental mitigation measures is assessed and unanticipated impacts identified; opportunities for mitigation, restoration and enhancement are recognised, identified and acted on.

3.5 All large dams have formalised operating agreements with time-bound licence periods; where re-planning or relicensing processes indicate that major physical changes to facilities or decommissioning may be advantageous, a full feasibility study and environmental and social impact assessment is undertaken.

EU Template: Section 3 Addressing Existing Dams/Hydroelectric Projects

Template wording:

1. For hydroelectric projects with dams, please describe the national requirements and routines for monitoring and reporting regarding: – emergency warning, – sediment management, – safety system, – maintenance system, – environmental impact, – social impact, – implementation of compensation agreements.
2. For non-dam projects, describe details of the continuous monitoring of the project (environmental and quality assurance).
3. How have relevant outstanding social and environmental issues from existing dams/hydroelectric projects in the river basin been addressed?
4. Have national regulations been enforced for existing dams and what can be concluded with regard to compliance?
5. Will the implementation of safety measures and evacuation plans be independently audited?

6. Provisions for maintenance and decommissioning
   – What provisions have been made for maintenance and refurbishment (e.g. a maintenance and refurbishment fund)?
   – What arrangements are made for decommissioning at the end of the plant lifetime, if any (e.g., decommissioning set aside fund)?
   – Describe provisions for emergency drawdown and decommissioning.
   – Are they sufficiently flexible to accommodate changing future needs and values, including ecosystem needs and ecosystem restoration (Guideline 12)?
   – Does the licence for project development define the responsibility and mechanisms for financing decommissioning costs?
   – Describe economic, environmental, social and political factors that may point against future decommissioning, if this has been recognised as the best solution.

Wording analysis

The WCD put considerable emphasis on options to improve the benefits from existing dams prior to building new ones. This recommendation is clearly addressed at those organisations who can make that choice (e.g., governments, some river basin organisations, multilateral and bilateral donors) and the degree to which individual project developers have such a margin for manoeuvre is debatable. The EU template is targeted at individual projects and many of the WCD proposals would require a dam developer to be running many existing dams to be able to respond to all elements of this strategic priority. Having said that, the template could have asked whether the developer had any other dams, and if so, sought to understand the degree of WCD compliance elsewhere in the river basin or system. As the EU decision on carbon credits seems to be targeted at new projects, it is quite hard to apply the WCD provisions that refer to existing dams.

The template lacks teeth in assessing the effectiveness of the WCD measures 3.1-3.4 because the measures refer to a set of dams operated by a single entity, which may not always be the case. Moreover, it is hard to validate the assessment as it uses open and descriptive answers.

WCD Strategic Priority 4: Sustaining Rivers and Livelihoods

Key message

Rivers, watersheds and aquatic ecosystems are the biological engines of the planet. They are the basis for life and the livelihoods of local communities. Dams transform landscapes and create risks of irreversible impacts. Understanding, protecting and restoring ecosystems at the river basin level is essential to foster equitable human development and the welfare of all species. Options assessment and decision-making around river development prioritises the avoidance of impacts, followed by the minimisation and mitigation of harm to the health and integrity of the river system. Avoiding impacts through good site selection and project design is a priority. Releasing tailor-made environment flows can help maintain downstream ecosystems and the communities that depend on them.

Effective implementation of this strategic priority depends on applying these policy principles:

4.1 A basin-wide understanding of the ecosystems' functions, values and requirements, and how community livelihoods depend on and influence them, is required before decisions on development options are made.

4.2 Decisions value ecosystems, social and health issues as an integral part of project and river basin development and prioritise avoidance of impacts in accordance with a precautionary approach.

4.3 A national policy is developed for maintaining selected rivers with high ecosystem functions and values in their natural state. When reviewing alternative locations for dams on undeveloped rivers, priority is given to locations on tributaries.

4.4 Project options are selected that avoid significant impacts on threatened and endangered species. When impacts cannot be avoided viable compensation measures are put in place that will result in a net gain for the species within the region.

4.5 Large dams provide for the releasing environmental flows to help maintain downstream ecosystem integrity and community livelihoods and are designed, modified and operated accordingly.

EU Template: Section 4 Sustaining Rivers and Livelihoods

Template wording:

4.1 Water use ratio[72] (ratio of natural flow, agricultural water, industrial water, domestic water…) including:

1. population of the river basin area (million inhabitants)
2. natural mean flow (km^3/year)
3. demand (km^3/year)
4. water use ratio (%)

72. Water use ratio is an environmental indicator which refers to the withdrawal of water for irrigation, industry and household use. A ratio of 25 per cent or higher is generally an indicator of water stress. Water-demanding activities can seriously affect its quantity and, in consequence, the availability of water resources. Some of these driving forces are urbanisation, industry and agricultural production. The increase in impervious surface has the effect of reducing water infiltration and aquifer recharge.

5. comparison of water demand with natural mean flow

6. storage capacity (km^3)

7. annual water consumption by type of users (hm^3/year): agricultural and farming, domestic use, industrial use.

4.2 Impact Assessment (Note: *both positive and negative impacts should be included here*)

What Impact Assessments have been carried out and on which regulations were they based?

– Describe the major impacts in each of the following categories and the mitigation measures for negative impacts:

4.2.1 Environmental Impacts

Describe environmental impacts of the project (including impact on water quality (temperature, oxygen, etc.), soil, air quality, GHG emissions, biodiversity, habitats, risk of erosion caused by inundation, etc.).

4.2.2 Environmental Flow Assessment

1. Describe how the environmentally safe minimum flow has been determined.

2. Describe the measures taken to minimise the impact of reduced flow in the affected river.

3. Describe the measures taken to maintain ecosystems, productive fisheries and other aqua-cultures downstream and upstream.

4. Describe the activities the project developer will undertake before flooding the land (e.g. clearing of vegetation or other preparations).

5. Describe any other compensatory measures addressing environmental impacts of the project.

4.2.3 Social Impact Assessment

1. Describe social impacts of the project (including resettlement, impacts on other land or river use, e.g. fishing, agriculture, hunting and use of other types of natural resources and including benefits to individuals and communities).

2. Describe any identified health impacts of the project.

3. Describe impacts on religious and cultural heritage.

4. Describe the liability provisions safeguarding the implementation of the planned measures.

5. Is the project planned in a responsible way in order to sustain livelihoods and the environment?

4.3 Cumulative Impacts

Describe the cumulative impacts of all hydrological structures existing in the river basin using variables such as:

1. flow regime, 2. water quantity, 3. productivity, 4. water quality species composition of different rivers in the same river basin.

Wording analysis

The WCD did not raise any of the issues raised in 4.1 (populations, water use ratio) and it is not entirely clear how such indices can or will be used. The template does not go as far as the WCD in environmental impacts in two critical ways. Firstly the terminology of environmental flows is that of a 'safe minimum flow'. The WCD was specifically challenging that approach. The issue of environmental flows is often encapsulated by determining the acceptable minimum flow. The WCD was at pains to point out that other indicators (such as peak flow, duration of particular flows, flood pulses, etc.) all play key roles in maintaining downstream biodiversity. The WCD set out with the intention of starting with the question: 'What does the endangered and threatened biodiversity need in terms of flow?' The template has turned this on its head, without mentioning favouring either endangered or threatened species. So, the criterion 4.2.2.3 'Describe the measures taken to minimise the impact of reduced flow in the affected river' is not equivalent to WCD 4.4 'Project options are selected that avoid significant impacts on threatened and endangered species. When impacts cannot be avoided viable compensation measures are put in place that will result in a net gain for the species within the region.'

WCD Strategic Priority 5: Recognising Entitlements and Sharing Benefits

Key message

Joint negotiations with adversely affected people result in mutually agreed and legally enforceable mitigation and development provisions. These provisions recognise entitlements that improve livelihoods and quality of life, and affected people are beneficiaries of the project. Successful mitigation, resettlement and development are fundamentally commitments and responsibilities of the State and the developer. They bear the onus to satisfy all affected people that moving from their current context and resources will improve their livelihoods. Accountability of responsible parties to agree mitigation, resettlement and development provisions is ensured through legal means, such as contracts, and through accessible legal recourse at national and international level.

Effective implementation of this strategic priority depends on applying these policy principles:

5.1 Recognition of rights and assessment of risks is the basis for identification and inclusion of adversely affected stakeholders in joint negotiations on mitigation, resettlement and development related decision making.

5.2 Impact assessment includes all people in the reservoir, upstream, downstream and in catchment areas whose properties, livelihoods and non-material resources are affected. It also includes those affected by dam related infrastructures such as canals, transmission lines and resettlement developments.

5.3 All recognised adversely affected people negotiate mutually agreed, formal and legally enforceable mitigation, resettlement and development entitlements.

5.4 Adversely affected people are recognised as first among the beneficiaries of the project. Mutually agreed and legally protected benefit sharing mechanisms are negotiated to ensure implementation.

EU Template: Section 5 Recognising Entitlements and Sharing Benefits

Template wording:
Are Mitigation, Resettlement and Development Action Plans (where applicable including commensurate compensation packages) in place? Provide details:

1. Demonstrate that the construction of the plant did not lead to worsening of the living conditions of the local residents and resettled families.
2. Were compensation and benefit agreements planned in consultation with affected groups?
3. What standards were the measures based on? (e. g. national standards or other)
4. Were the affected people satisfied with the compensation packages?
5. Benefits for the affected people (individuals and communities): in what way will the affected local and indigenous population's livelihoods be improved due to the project?

Wording analysis

This section does not meet the aspirations of the WCD in placing affected communities at the centre of the development process. The template treats affected people as passive 'recipients' rather than as actors and beneficiaries. There is no mention of entitlements, of risk, of negotiation, or of legal agreements, all fundamental tenets of the WCD approach. The questions are open and descriptive and focus on compensation, rather than on participation and sharing project benefits. The term 'did not lead to worsening of the living conditions' reflects 'old thinking' and does not meet the WCD's recommendation of making affected people partners and beneficiaries with real development opportunities stemming from the dam.

Question 2 asks if benefits were planned, but no indication of if they are delivered or are legally enforceable.

WCD Strategic Priority 6: Ensuring Compliance

Key message

Ensuring public trust and confidence requires that governments, developers, regulators and operators meet all commitments made for the planning, implementation and operation of dams. Compliance with applicable regulations, criteria and guidelines, and project-specific negotiated agreements is secured at all critical stages in project planning and implementation. A set of mutually reinforcing incentives and mechanisms is required for social, environmental and technical measures. These should involve an appropriate mix of regulatory and non-regulatory measures, incorporating incentives and sanctions. Regulatory and compliance frameworks use incentives and sanctions to ensure effectiveness where flexibility is needed to accommodate changing circumstances.

Effective implementation of this strategic priority depends on applying these policy principles:

6.1 A clear, consistent and common set of criteria and guidelines to ensure compliance is adopted by sponsoring, contracting and financing institutions and compliance is subject to independent and transparent review.

6.2 A Compliance Plan is prepared for each project prior to commencement, spelling out how compliance will be achieved with relevant criteria and guidelines and specifying binding arrangements for project-specific technical, social and environmental commitments.

6.3 Costs for establishing compliance mechanisms and related institutional capacity, and their effective application, are built into the project budget.

6.4 Corrupt practices are avoided through enforcement of legislation, voluntary integrity pacts, debarment and other instruments.

6.5 Incentives that rewards project proponents for abiding by criteria and guidelines are developed by public and private financial institutions.

EU Template: Section 6 Ensuring Compliance

Template wording:

6. Compliance measures:

1. What will be done to ensure that relevant laws, regulations, agreements (including resettlement and compensation agreements) and recommendations are followed?

2. Are the compensation agreements legally binding – through treaties, administrative acts or other safeguards?

3. Is the cost of the compensation package included in the financial plan?

4. Does the project developer already operate other hydroelectric power stations? If so, have there been any conflicts between the project developer and stakeholders over the development, operation and compensatory measures related to these projects? If so, describe the cause of the conflict and how it was resolved.

6.2 Monitoring and evaluation during crediting period:

1. Describe conditions in place for monitoring and evaluation of environmental and socio-economic impacts of the project.

2. What provisions have been made to ensure that all measures not yet implemented at the time of validation will be put in place as appropriate, and monitored (for example through an independent auditing panel or auditor or through self-auditing)?

Wording analysis

The key provision of the WCD, given the variable and complex nature of local regulations, was to provide for a 'compliance plan' for each project. The template does not ask for a plan, nor checks it exists. It asks proponents to 'describe' the monitoring of environmental and socio-economic impact, and asks for details of the compensation plans (but not respect for environmental funding). In general, many of these impacts may also be managed by entities external to the project developer (e.g. the state) and the questions don't really get to the heart of understanding whether the developer is indeed constrained to comply or not.

WCD Strategic Priority 7: Sharing Rivers for Peace, Development and Security

Key message

Storage and diversion of water on transboundary rivers has been a source of considerable tension between countries and within countries. As specific interventions for diverting water, dams require constructive co-operation. Consequently, the use and management of resources increasingly becomes the subject of agreement between States to promote mutual self-interest for regional co-operation and peaceful collaboration. This leads to a shift in focus from the narrow approach of allocating a finite resource to the sharing of rivers and their associated benefits in which States are innovative in defining the scope of issues for discussion. External financing agencies support the principles of good faith negotiations between riparian States.

Effective implementation of this strategic priority depends on applying these policy principles:

7.1 National water policies make specific provision for basin agreements in shared river basins. Agreements are negotiated of the basis of good faith among riparian States. They are based on principles of equitable and reasonable utilisation, no significant harm, prior information and the Commission's strategic priorities.

7.2 Riparian States go beyond looking at water as a finite commodity to be divided and embrace an approach that equitably allocates not the water but the benefits that can be derived from it. Where appropriate, negotiations include benefits outside the river basin and other sectors of mutual interest.

7.3 Dams on shared rivers are not built in cases where riparian States raise an objection that is upheld by an independent panel. Intractable disputes between countries are resolved through various means of dispute resolution including, in the last instance, the International Court of Justice.

7.4 For the development of projects of rivers shared between political units within countries, the necessary legislative provision in made at national and sub-national levels to embody the Commission's strategic priorities of 'gaining public acceptance', 'recognising entitlements' and 'sustaining rivers and livelihoods'.

7.5 Where a government agency plans or facilitates the construction of a dam on a shared river in contravention of the principle of good faith negotiations between riparians, external financing bodies withdraw their support for projects and programmes promoted by that agency.

EU Template: Section 7 Sharing Rivers for Peace, Development and Security

Template wording:
Does the project have transboundary impacts? If so, give details of agreement(s) between affected countries, considering international recommendations for transboundary water projects and describe how this affects the project.

Wording analysis

The WCD uses a series of key terms such as 'equitable and reasonable utilisation', 'no significant harm', and 'prior information' that condition the relations between states that share a river system. The template does not seek information on any of these specific issues.

WCD SP7.5 also stipulates 'Where a government agency plans or facilitates the construction of a dam on a shared river in contravention of the principle of good faith negotiations between riparians, external financing bodies withdraw their support for projects and programmes promoted by that agency.' This should presumably require that no hydropower credits are given to projects run by state-owned agencies in countries that decline to participate in negotiations on river basin management with downstream countries. Yet China, which declines to participate formally in such transboundary negotiations (for example in the Mekong), remains the primary beneficiary of hydropower CDM credits via the UK DNA.

Annex 6 Extract from IFC Performance Standard 1

Assessment and Management of Environmental and Social Risks and Impacts (IFC, 2012)

Consultation

30. When Affected Communities are subject to identified risks and adverse impacts from a project, the client will undertake a process of consultation in a manner that provides the Affected Communities with opportunities to express their views on project risks, impacts and mitigation measures, and allows the client to consider and respond to them. The extent and degree of engagement required by the consultation process should be commensurate with the project's risks and adverse impacts and with the concerns raised by the Affected Communities. Effective consultation is a two-way process that should: (i) begin early in the process of identification of environmental and social risks and impacts and continue on an ongoing basis as risks and impacts arise; (ii) be based on the prior disclosure and dissemination of relevant, transparent, objective, meaningful and easily accessible information which is in a culturally appropriate local language(s) and format and is understandable to Affected Communities; (iii) focus inclusive engagement on those directly affected as opposed to those not directly affected; (iv) be free of external manipulation, interference, coercion, or intimidation; (v) enable meaningful participation, where applicable; and (vi) be documented. The client will tailor its consultation process to the language preferences of the Affected Communities, their decision-making process, and the needs of disadvantaged or vulnerable groups. If clients have already engaged in such a process, they will provide adequate documented evidence of such engagement.

Informed Consultation and Participation

31. For projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation (ICP) process that will build upon the steps outlined above in Consultation and will result in the Affected Communities' informed participation. ICP involves a more in-depth exchange of views and information, and an organized and iterative consultation, leading to the client's incorporating into their decision-making process the views of the Affected Communities on matters that affect them directly, such as the proposed mitigation measures, the sharing of development benefits and opportunities, and implementation issues. The consultation process should (i) capture both men's and women's views, if necessary through separate forums or engagements, and (ii) reflect men's and women's different concerns and priorities about impacts, mitigation mechanisms, and benefits, where appropriate. The client will document the process, in particular the measures taken to avoid or minimize risks to and adverse impacts on the Affected Communities, and will inform those affected about how their concerns have been considered.

Indigenous Peoples

32. For projects with adverse impacts to Indigenous Peoples, the client is required to engage them in a process of ICP and in certain circumstances the client is

required to obtain their Free, Prior, and Informed Consent (FPIC). The requirements related to Indigenous Peoples and the definition of the special circumstances requiring FPIC are described in Performance Standard 7.

Private Sector Responsibilities Under Government-Led Stakeholder Engagement

33. Where stakeholder engagement is the responsibility of the host government, the client will collaborate with the responsible government agency, to the extent permitted by the agency, to achieve outcomes that are consistent with the objectives of this Performance Standard. In addition, where government capacity is limited, the client will play an active role during the stakeholder engagement planning, implementation, and monitoring. If the process conducted by the government does not meet the relevant requirements of this Performance Standard, the client will conduct a complementary process and, where appropriate, identify supplemental actions.

External Communications and Grievance Mechanisms

External Communications

34. Clients will implement and maintain a procedure for external communications that includes methods to (i) receive and register external communications from the public; (ii) screen and assess the issues raised and determine how to address them; (iii) provide, track, and document responses, if any; and (iv) adjust the management program, as appropriate. In addition, clients are encouraged to make publicly available periodic reports on their environmental and social sustainability.

Grievance Mechanism for Affected Communities

35. Where there are Affected Communities, the client will establish a grievance mechanism to receive and facilitate resolution of Affected Communities' concerns and grievances about the client's environmental and social performance. The grievance mechanism should be scaled to the risks and adverse impacts of the project and have Affected Communities as its primary user. It should seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate and readily accessible, and at no cost and without retribution to the party that originated the issue or concern. The mechanism should not impede access to judicial or administrative remedies. The client will inform the Affected Communities about the mechanism in the course of the stakeholder engagement process.

Ongoing Reporting to Affected Communities

36. The client will provide periodic reports to the Affected Communities that describe progress with implementation of the project Action Plans on issues that involve ongoing risk to or impacts on Affected Communities and on issues that the consultation process or grievance mechanism have identified as a concern to those Communities. If the management program results in material changes in or additions to the mitigation measures or actions described in the Action Plans on issues of concern to the Affected Communities, the updated relevant mitigation measures or actions will be communicated to them. The frequency of these reports will be proportionate to the concerns of Affected Communities but not less than annually.

Annex 7 Extract from OECD Council recommendation

Organisation de Coopération et de Développement Économiques

Organisation for Economic Co-operation and Development

28-Jun-2012

TRADE AND AGRICULTURE DIRECTORATE TRADE COMMITTEE

Working Party on Export Credits and Credit Guarantees

RECOMMENDATION OF THE COUNCIL ON COMMON APPROACHES FOR OFFICIALLY SUPPORTED EXPORT CREDITS AND ENVIRONMENTAL AND SOCIAL DUE DILIGENCE (THE "COMMON APPROACHES") TAD/ECG(2012)5

V. ENVIRONMENTAL AND SOCIAL REVIEW

23. In the absence of any relevant industry sector EHS Guidelines, Members:

- should benchmark against the relevant aspects of any internationally recognised sector specific or issue specific standards such as, where appropriate, the Convention on Nuclear Safety and the relevant aspects of International Atomic Energy Agency (IAEA) standards for nuclear power plants; and/or
- may refer to relevant international sources of guidance such as, for example, where appropriate, the Hydropower Sustainability Assessment Protocol and the Core Values and Strategic Priorities of the World Commission on Dams (WCD) Report for hydro-power projects.

OECD (2012).

Natural Resource Issues

Natural resources are having the life squeezed out of them. Volatile commodity prices have highlighted both the vulnerability of poor people to rapid rises in food and energy prices and the associated 'squeeze' on natural resources. Escalating competition for such resources (including biodiversity, energy, forests, food, land and water) will reshape patterns of investment, production and consumption among countries and social groups and between cities and rural areas. The Natural Resource Issues series presents peer-reviewed, easy to read material on issues that cut across these sectors. Each issue draws on original research to make conclusions that are particularly relevant for policy makers, researchers and other opinion formers in the field concerned.

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Watered down? A review of social and environmental safeguards for large dam projects

Hydropower is back in the spotlight. Many large dams are now being built after a lull at the end of the last century. And some are being built in the name of climate change mitigation and adaptation. New sources of finance – from China and private banks internationally – and new financing tools including carbon trading are also playing their part. Large dams have large and specific social and environmental impacts that require well targeted responses. Population displacement, alteration of downstream flows, and creation of barriers to the movement of aquatic life, all pose unique challenges that are often not provided for in national environmental or water legislation.

However, a proliferation of standards and guidelines around dams is causing its own problems. Which safeguards are required and for whom? This report assesses the compulsory, donor-driven and voluntary frameworks that seek to ensure sustainable outcomes from large hydropower dams. The application of these frameworks is considered in light of particular dam projects, and recommendations are made to ensure that human welfare and sustainability are at the heart of decision-making about large dams.

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