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Addressing conflict over dams: The inception and establishment of the World Commission on Dams

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Abstract
The World Commission on Dams (WCD) was active between 1998 and 2000. Despite the Commission's short life, it left a lasting mark on the global debate on large dams, one of the most intractable and conflicted issues in environmental governance. Existing accounts of the Commission focus chiefly on its recommendations and their influence on dam planners. Another major topic of interest has been the novelty of making global environmental policy through multi-stakeholder dialogue rather than through intergovernmental negotiation. This focus on technicalities, results, and institutional design underplays the Commission's political significance. It was a bold and innovative attempt to find common ground between promoters and opponents of dams on which a new way of thinking about and planning dams could be built. In this paper, we focus on the emergence of the Commission, in response to the evolving conflict over dams, particularly between the World Bank and its critics. We explore the processes that led to the establishment of the Commission and its role as an attempt to transform conflict into cooperation by bringing together pro- and anti-dam communities.

Keywords Development planning · Dam construction · Environmental movements · IUCN · Large dams · World Bank

> *We just need to find that middle ground among the different perspectives, because there's truth in the perspectives of the business sector, there's truth in the government needs and the right to development, and there's real existential issues around indigenous communities and local communities.*[1]

[1]Interview, WCD Secretariat staff, June 2019.

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Introduction

The work of the World Commission on Dams (WCD) between 1998 and 2000 marked a significant inflection point in the long history of controversy over the social and environmental impacts of dams. Before it came two decades of intense global activism against large dams. After it came decades characterized by wider recognition of the impacts of dams, some reappraisal of the balance of costs and benefits, and a pause in new project development followed by a resurgence of dam building, albeit with new organisational coalitions of funding design and construction (Baghel and Nüsser 2010; Bosshard 2010; Dubash 2009; Moore et al. 2010).

The WCD was based in Cape Town, South Africa. It began its work in May 1998, and completed and presented its report at the end of 2000–just 30 months to undertake a huge programme of work. The WCD had a double mandate: first, "review the development effectiveness of large dams and assess alternatives for water resources and energy development;" second, "develop internationally acceptable criteria, guidelines, and standards where appropriate, for the planning, design, appraisal, construction, operation, monitoring, and decommissioning of dams" (WCD 2000: 28). Extensive stakeholder consultation, research, and review of existing evidence was fed into the "WCD knowledge base," which was then synthesised and reviewed by Commissioners and their staff to produce a final report with recommendations for global dissemination.

Despite the Commission's short life, it has left a lasting mark on the global debate on large dams. The Commission's work was broad, covering a diversity of fields, from economics and finance, law, public health, and cultural heritage conservation, to dam planning, operation, monitoring, and decommissioning. While there has been some interest by international relations scholars in the Commission due to its then unusual institutional set-up as a multi-stakeholder dialogue forum (Bisht 2008; Conca 2002; Dingwerth 2003; Dubash 2009; Ottaway 2001), most assessments of the Commission are based primarily on its final report, *Dams and Development*, published in November 2000 (WCD 2000). This continues to be a key reference point for academics, policy-makers, government planners, international organisations, activists, and the corporate sector, wherever the social and environmental impacts of large dams are discussed and the question of the balance of benefits and costs of a new dam project is raised (Fujikura and Nakayama 2009; Schulz and Adams 2019).

From the inside, Commissioners, staff, and others have offered personal perspectives on process, successes, and failures (Asmal 2001; Bosshard 2010; Briscoe 2001; Cariño and Colchester 2010; Goodland 2010; Iyer 2001; McCully 2001; Moore et al. 2010; Schultz 2002; Scudder 2019; Sengupta 2001). Others have criticised its work from the outside. One critic argued "its contents are full of generalities, not based on facts, the data quoted are selective, information provided is misleading and the conclusions drawn are biased" (Navalawala 2001: 1010). Another huffed "would the world have been any different, now or 10 years hence, if the WCD had not been established? The authors' view is that it would not have mattered very much one way or another!" (Biswas 2012: 16). A number of critics argued that the Commission was not neutral, overemphasising the negative impacts of dams as opposed to benefits, and taking an "anti-dam" position (Biswas 2012; Briscoe 2010; Navalawala 2001; Schultz 2002; Thatte 2001; Tortajada 2016).

Existing accounts of the World Commission on Dams chiefly focus on its recommendations, and the extent to which they have or have not been adopted by dam planners in

subsequent years. However, although important for subsequent approaches to dam projects, the true significance of the Commission's work was not technical, but political. A focus on its outputs and impact draws attention away from the boldness of its vision, the scope of the conflict over dams in the 1990s and particularly the significance of the issue for multilateral and bilateral aid donors. These topics are the focus for this paper. We explore the evolution of the conflict around large dams between the 1950s and 1970s and the increasing polarisation between pro- and anti-dam interests, especially the World Bank's funding of dams, in the 1980s and 1990s. We offer an empirical account of the attempt to bring warring sides together in the WCD, to build a coalition of people willing to change the basis on which dams were planned, and in doing so to provide a more sustainable foundation for future dam projects.

Our account of the WCD's work is informed by oral history interviews with those who participated in the Commission's work: former Commissioners themselves, staff of the Commission's Secretariat, consultants, and members of the Stakeholder Forum. All interviews were conducted between 2019 and 2020.[1] This enabled us to focus on broader narratives around its historical significance and legacies, as well as informal aspects of its work, rather than the more technical aspects captured in its many unofficial reports and documents. The Commission's work brought directly conflicting parties and globally relevant actors together and instilled in them a sense of momentum and urgency. The closeness between supporters and opponents of large dams in the work of the Commission gave a personal dimension to what could be considered a technical or political issue, and made WCD an institution that is remembered intensely, fondly or not, by those who were involved in it.

Conflict over the social and environmental impacts of large dams

The planning, construction, operation, and maintenance of large infrastructure projects raises complex development challenges. Dams have diverse impacts on river and floodplain environments, and the people who use them. Upstream, settlements, productive, and wild lands are flooded beneath reservoirs. Downstream, altered flood patterns affect fisheries, riverine and floodplain ecosystems, and communities. Impacts, social costs and benefits are unevenly distributed, and have often been a source of legal and political opposition (Schulz and Adams 2021; Scudder 2005; WCD 2000).

Controversy has long been associated with dam construction, from the mill dams of the industrial revolution in the eighteenth and the nineteenth centuries (for example in the eastern USA), the flooding of the Hetch Hetchy Valley in Yosemite National Park in the early twentieth century, or opposition to the US Bureau of Reclamation's proposal to build the Echo Park Dam on the Green River in Utah in the 1950s, or Glen Canyon Dam on the

[1] This paper is based on 91 interviews/written responses: 8 of the 12 Commissioners (Kader Asmal, Lakshmi Chand Jain and Jan Veltrop have died; one Commissioner did not respond to an interview request), 10 full time staff of the WCD Secretariat, 8 WCD research fellows, 10 participants of the 1997 workshop on dams held in Gland (Switzerland), 25 Stakeholder Forum members and 39 other consultants, advisers and lead writers of contributing reports. Some respondents had multiple roles, for example as participants at the Gland workshop and then within WCD. Interviews were conducted in person (13), via phone call (20), Skype (48), and Zoom (1). 9 (comparatively less substantial) responses were provided in writing only. Interview transcripts and written responses were coded with NVivo 12. Prior to conducting interviews, interviewees were informed that any quotes cited in publications would be anonymised.

Colorado in the 1960s (Crane 2015; McCully 1996). The ecological and socio-economic impacts of dams were an important element in discussions of international development in the 1960s, with a number of major projects planned or created in the tropics (Adams 1992; Bromber et al. 2014; Fernea and Kennedy 1966; Gonzalez 1972; Mossallam 2014; Scudder 1973; Swayamprakash 2014; Usher 1997; Warren and Rubin 1968). Research began on the ecology of novel tropical "man-made lakes" in Africa (Ackermann et al. 1973; Lowe-McConnell 1966; Obeng 1969), and dams were discussed at the international conference in the USA in 1968 that led to the publication of *The Careless Technology: Ecology and International Development* (Farvar and Milton 1973). A convention on wetlands was first proposed in 1962, to draw attention to the loss of wetlands from dams and other forms of development, eventually being adopted in the Iranian city of Ramsar in 1971, coming into force in 1975 (Ramsar Convention 2021).

By the 1970s, the ecological impacts of river impoundment were increasingly well understood, and there were growing efforts to design strategies to minimise them (Baxter 1977). In 1973, the International Union for the Conservation of Nature and Natural Resources (IUCN) and the Conservation Foundation produced a book to guide development planners: *Ecological Principles for Economic Development* (Dasmann et al. 1973).[2] The impacts of dams were highlighted as a problem at the Biosphere Conference in 1968 and in the UNESCO Man and the Biosphere programme (launched in 1971), the United Nations Conference on the Human Environment in Stockholm in1972, and the World Conservation Strategy (1980) (Adams 2020). The International Commission on Large Dams (ICOLD), established in 1928 to represent the dam construction industry, published reports in 1980, setting out how to minimise the negative environmental impacts of new dams (ICOLD 1980, 1981).[3]

Dam construction continued to expand across global river basins through the second half of the twentieth century (Nilsson et al. 2005). In India, for example, a series of major dam projects was begun in the Narmada River basin in Gujarat, most prominently, the Sardar Sarovar Dam in the 1980s (Wood 1993), while construction of the world's largest hydropower dam, the Three Gorges Dam on the Yangtze River, began in China in 1994 (Qing and Sullivan 1999). Where governments, economists, and engineers saw an opportunity to make great leaps in terms of hydroelectric power production, irrigation performance, flood control, and water supply, activists around the world fought for recognition of dams' negative impacts on forcibly resettled people and the natural environment.

With the proliferation of dam projects came the growth of social movements in opposition. Major dam projects were proposed and opposed in many countries, including the UK, Norway, Sweden, Australia, Bulgaria, Latvia, and in Hungary (Atkins 2018; Dalland 1997; Lövgren 1997; McCully 1996). In the 1980s the *Ecologist* magazine began to campaign against large dams internationally, the International Rivers Network (IRN) was founded, and publication of the *International Dams Newsletter* began (Goldsmith and Hildyard 1984; McCully 1996). By the end of the 1980s, debate about the construction of large dams, particularly dams in the Global South, had become increasingly fierce and polarised. Local environmental movements were linking with and campaigning alongside (and were financially assisted by) groups in the Global North (Shah et al. 2021). In an era when awareness

[2] IUCN was known as 'World Conservation Union' from 1990 to 2008.

[3] ICOLD defines a 'large' dam as one over 15m in height or one that has a reservoir volume of more than 3million m^3 and a height of 5-15m.

of anthropogenic climate change was limited, large dam projects took an important place in environmental critiques of development, and were a focus of work by an increasingly interconnected global environmental movement.

Dam conflicts in the 1980-1990s: anti-dam activists versus the World Bank

In the 1980s and 1990s, opposition to dams began to focus with increasing intensity on the role of aid donors in financing project identification, feasibility studies, design, and construction. Projects were often planned without adequate consideration of environmental and social impacts, or compensation for resettled people, which created fertile ground for activism. Opposition to large dams by civil society organisations grew in strength and numbers in many countries (Khagram 2004; Shah et al. 2021).

In India, the NGO Narmada Bachao Andolan (Save the Narmada Movement), was founded in 1989, and began to campaign against dams in the Narmada basin (Dwivedi 1998; Gandhi 2003). In Brazil, the Movimento dos Atingidos por Barragens (MAB, Movement of People Affected by Dams), was formally founded in 1991 (Benincá 2010; Moraes Corrêa 2019; Vainer 2009). These organisations found allies in international NGOs working in the field of environment and development more broadly, such as the US-based IRN (founded in 1985), the Swedish Society for Nature Conservation, the Swiss Berne Declaration (an NGO which has since changed its name to "Public Eye"), or Focus on the Global South, headquartered in Bangkok, Thailand (Bello 2007; McCully 2001; The International Rivers Network 1996; Usher 1997).[4] In 1988, global activists signed the "San Francisco Declaration" at an international conference organised by the IRN, which contained a detailed list of criteria that should be addressed during dam construction that included, among others, free access to information held by dam funders to citizens of lending and recipient countries, clear statement of project goals and evaluation of potential alternatives, and a detailed evaluation of all direct and indirect project costs and benefits (Adams 2020; McCully 1996; Scheumann 2008).

Further localised campaigns against individual dams appeared in the 1990s, for example against the Chilean Ralco Dam, which inundated land in indigenous Mapuche-Pehuenche territories (Nesti 2002), against Nepal's Arun III, an ambitious yet expensive hydropower dam project in a remote Himalayan valley (Pandey 2015; Saklani 2021). Campaigns continued against the Slovakian-Hungarian Gabcikovo-Nagymaros dams project, first proposed by government planners under state socialism, which had become the source of a legal dispute between both countries (Galambos 1993).

Battles against dams were fought via the media, public opinion, and in the courts. Under the leadership of Medha Patkar, Baba Amte, and others, the Indian NBA were particularly successful in raising the profile of the struggle against the Narmada dams, conducting hundreds of non-violent protests (*satyagrahas*), as well as hunger strikes, or symbolic collective near-drownings in the rising dam reservoir (Leslie 2005). Although NBA's campaigns often focused on the inadequacies of resettlement and compensation of tribal villagers displaced by the dams, their actions emerged out of a much broader, critical attitude towards a large-scale top-down development model.

[4] Interview, WCD Forum member/observer, October 2019.

The most vulnerable targets of these campaigns were multilateral funders, in particular, the World Bank. This had repeatedly been the target of anti-dam campaigns since the late 1980s, because of its central role as funder and provider of expertise in many dam projects. The 1988 "San Francisco Declaration" deliberately targeted international donors. In Washington, Indian activists gave evidence on Sardar Sarovar at a special hearing at a Sub-Committee of the US Congress in 1990, which prompted members of congress to send a letter to the Bank, asking to reconsider support for the project (Dwivedi 1998).

The specific pressure on the World Bank about loans for dams formed part of broader campaigning about lending for major infrastructure projects, dating back to the 1970s and 1980s (Kennedy 1988; Stein and Johnson 1979). The World Bank adopted its first official statement on environmental impacts of its projects in 1984, stating that the Bank would not finance projects that caused significant environmental degradation or affected official protected areas (Goodland 1984; World Bank 1984). In 1987 the World Bank created an Environment Department with scientific and technical staff located centrally and in regional offices (Holden 1987; Rich 1994). The Bank produced an environmental policy statement and papers on involuntary resettlement, wildlands conservation, pollution control and pesticides, and tribal people (Goodland 1990). Despite this, the Bank remained a complex and sometimes divided organisation on environmental and social issues. These were still often treated as obstructions to the funding pipeline; the Bank's environmental staff had little influence (Watson 1985), and environmental groups maintained their pressure (Goldsmith 1987).

In 1991, controversy over lending to projects in the Narmada basin led the World Bank's board of directors to set up a review of the Sardar Sarovar dam under Bradford Morse, former director of UNDP (Fox 1998). This "Morse Commission" concluded in 1992 that the Bank had flouted its own environmental and resettlement policies and recommended that it withdraw funding from the project (Berger 1993). The following year, the Bank did so, and was followed by the Japanese government, responding to lobbying by Friends of the Earth Japan. The World Bank also cancelled a planned loan to the Arun III Dam in Nepal (Pandey 2015; Saklani 2021; Usher 1997). Policy continued to shift: a review of resettlement in Bank projects recommended changes, and improved procedures and a new water resources management policy in 1993 made "environmental protection and mitigation" integral elements of a comprehensive approach to water development (Fox 1998; Moore and Sklar 1998).

Campaigners thus won an important symbolic victory when the World Bank withdrew from Sardar Sarovar (although this did not stop the dam being completed several decades later under the government of Prime Minister Modi in 2017; for an overview of its impacts on dam building and policy in India see: Ranjan 2018). However, both activists and World Bank staff understood that painting the World Bank as the sole villain of the story was a huge oversimplification. The World Bank was the leading multilateral donor, and represented a certain, traditional model of development. It was thus an effective target for broader campaigns. However, it was not a monolithic organisation. Inside it, there was a diversity of opinions and attitudes towards dam planning and working with civil society.[5] In the case of

[5] Several interviewees cited Robert Goodland (1939–2013) as someone within the World Bank who tried to raise awareness for the social and environmental impacts of dams and was open to working with civil society. For Goodland's own perspective, see Goodland (2010) and The World Bank Oral History Program (2005).

Sardar Sarovar, some activists (but not all), though feeling vindicated by the World Bank's departure from the project and describing it as a campaigning success, privately lamented the loss of its potentially moderating influence on the Indian government.[6] Despite having been criticised fiercely, individual staff within the organisation were open to engaging with activists, often more so than their client governments.

Moreover, the World Bank was by no means the only source of funds. In the case of Narmada, the Government of India stepped in to finance completion. A World Bank source suggested: "the Indian government didn't pay a lot of attention to us, so people considered us to be more powerful than we really were."[7] The part-completed dam started to impound in 1993, and after a series of legal actions before the Indian Supreme Court, the dam was eventually completed. An activist commented: "Suppose in some other country, the World Bank had withdrawn from a project like the Narmada, it would have had some impact; in India it had no impact whatsoever. The government said: 'No problem, we'll get the money and go ahead.' That was it."[8] A consultant familiar with the case observed "[this] was a good result. If they're going to screw up a project, they should do it with their own money."[9] An implication of this narrative is that the World Bank's withdrawal from Sardar Sarovar was much more consequential for the Bank itself, than for the outcome of the project it had originally agreed to fund.

Anti-dam pressure on the World Bank continued. In 1994, 326 environmental groups and coalitions from 44 countries presented the "Manibeli declaration" to the World Bank's president on the occasion of its fiftieth anniversary, calling for a moratorium on World Bank funding for large dams (McCully 1996, 2001). Nonetheless, critics continued to argue that the Bank's practices, with respect to the environmental and social impacts of the projects they financed, fell short of its promises (Fox and Brown 1998; Goldman 2005). The Bank also found itself under attack by campaigners against the Chilean Ralco Dam, culminating in a public apology by Bank president James Wolfensohn in 1998, a subsequent investigation by the Bank's International Finance Corporation (IFC), and compensation payments to some of the indigenous people who had been displaced (Johnston and Garcia-Downing 2004; Nesti 2002).

From 1995, collaboration and dialogue with stakeholder groups and civil society became official policy of the World Bank under the presidency of Wolfensohn.[10] The Bank's Operations Evaluation Division (OED) undertook an internal review of 50 large dam projects. This reported in 1996, finding that mitigation of large dams' negative social and environmental impacts would not have affected their economic feasibility, although a coalition of NGOs went on to publicly criticise the review. They alleged that the OED lacked the necessary independence to evaluate World Bank projects, that the review was biased in favour of large dams, and based on a flawed methodology which would ensure pro-dam conclusions (McCully 2001). The WCD final report cited the OED review as one of the main reasons for the establishment of WCD (WCD 2000). A Commissioner paraphrased Wolfensohn's

[6] Interview, WCD Forum member/observer, August 2019.

[7] Interview, Consultant/adviser to WCD Secretariat, August 2019.

[8] Interview, Contributing report writer for WCD, January 2020.

[9] Interview, Contributing report writer for WCD, September 2019.

[10] Walden Bello and Shalmali Guttal provide a highly critical account of this newfound openness in Bello and Guttal (2006); Note that Guttal represented Bangkok-based NGO "Focus on the Global South" in the WCD Stakeholder Forum.

reaction to the OED review as follows: "Somehow we're stuck here. Some believe, [dams] are temples, the others believe, they are hell, and the World Bank is only getting in trouble all the time!"[11]

Inventing the World Commission on Dams

Robert "Bob" Picciotto of the World Bank's Operations Evaluation Division suggested the organisation of a stakeholder workshop to bring together the opposing sides of the large dams debate in 1997.[12] The idea quickly gained traction inside the World Bank, winning support of Wolfensohn and senior staff such as the director of the Environment Department, Andrew Steer, the director of the Industry and Energy Department, Richard Stern, or the World Bank's senior water advisor, John Briscoe.[13]

To reach critical and anti-dam voices, staff in the Bank's OED felt it would be useful to partner with IUCN who had better links with civil society and whose presence might help establish trust that a workshop was going to take their concerns seriously. IUCN is an unusual international organisation, in that it had both governmental and non-governmental members, and had been at the heart of international environmental governance debates through the 1960s and 1970s (Holdgate 1999). The IUCN Director-General, David McDowell (1994–1999), Assistant Director-General, George Greene, and the IUCN senior policy advisor at the Global Policy and Partnership Unit of IUCN in Washington, Achim Steiner, supported the idea of a workshop.

During the preparations for the workshop, the global anti-dam movement maintained pressure on the World Bank: a global coalition of dam-affected people called for a right to participation and consent in dam planning and construction in mid-March of 1997, in the Declaration of Curitiba, Brazil, showing the global reach of the movement against dams despite the localised nature of impacts. Calls to governments, international agencies and investors for a moratorium on dam construction became increasingly widespread (ERN 1997; Goodland 2010).

The stakeholder workshop on large dams was held in Gland, Switzerland, in April 1997, jointly hosted by World Bank and IUCN. The stated purpose of the Gland meeting was to discuss the findings of the Bank's OED review. In his opening statement, Robert Picciotto summarised its mission: "According to Thoreau, 'Rather than love, than money, than life, give me truth.' What then is the truth about large dams? Thoreau also said: 'A man is rich in proportion to the number of things he can afford to let alone.' But can developing countries afford to let large dams alone?" (Picciotto 1997).

In many ways, this workshop represented a miniature version of the World Commission on Dams to come: facts and figures on dams were discussed by a diverse group that included around 30 stakeholders, including supporters and opponents of large dams. It was facilitated by Tony Dorcey, an academic from the University of British Columbia, Canada, specialising in negotiation and mediation in sustainability governance, and coordinated by Achim Steiner, who had previously worked for IUCN in Southern Africa, and as noted above, had

[11] Interview, WCD Commissioner, October 2019.

[12] Interview, Gland workshop participant, August 2019.

[13] Interview, Gland workshop participant, August 2019.

been involved in discussions with the World Bank. What might have appeared as a very technical meeting was actually an exercise in bridge-building between different camps. This required building trust and a human connection, as one participant of the process recounted. The whole of the first morning was given up to "letting people vent and so on." Later Dorcey made participants draw a name out of a hat, of someone they had to talk to so that they could introduce them to the whole group, which forced critics and supporters of dams to interact in a constructive way. [14]

A key outcome of the Gland meeting was the idea of a World Commission on Dams. Activists had been calling for an independent commission as early as 1994, in the hope it would be as impactful as the Morse Commission's review of the Sardar Sarovar project (Dubash 2009; ERN 1997; McCully 2001). However, now participants at Gland (including those from the Bank) also saw an independent commission as a way to break the stalemate between dam supporters and opponents. As the activist Patrick McCully observed, for the World Bank, this was an opportunity to shift attention from their own failures, which had been made painfully visible in the OED review, while for activists, the creation of an independent commission fulfilled one of their key demands (McCully 2001). An activist at Gland recalled: "Well, actually I was quite surprised at the ease with which it was agreed that an independent commission would be formed; we had thought that we may have to fight a fair bit for it." They suggested that [the World Bank and IUCN] "had sort of already agreed to it", although at the meeting "there was a common agreement on such a commission."[15]

Creating the World Commission on Dams: managing diversity

If agreeing to the formation of a World Commission on Dams was easy, the process of nominating members was not. After the Gland workshop, the World Bank and IUCN formed an Interim Working Group that was meant to select members in consultation with a reference group of stakeholders that had attended the workshop. First, the South African Minister for Water Affairs and Forestry, Kader Asmal, was nominated as Chair by the World Bank, perhaps due to lobbying by its South African senior water advisor, John Briscoe.

The choice of Asmal as Chair was welcomed by different stakeholder groups, because of his recognised role as a long-standing anti-apartheid activist and professor of human rights during his time in exile in Dublin, Ireland. One respondent noted the strong symbolic importance of having a distinguished anti-apartheid activist chairing the Commission's discussions, saying: "It gave [WCD] a sort of unimpeachable quality that, given the darkness of how dams had hurt so many people, they had to have people from a liberation movement involved but who were being peace brokers in the middle. It was very powerful."[16]

At the same time, as a government official, Kader Asmal had also taken decisions on dam construction, most notably, the Lesotho Highlands Water Project, which was controversial at the time due to its impact on displaced communities (Thabane 2000). His support for this project made him acceptable to pro-dam groups. Yet, despite being in charge of water affairs in South Africa, his main expertise was in law and politics. One contact said: "when he was

[14] Interview, Gland workshop participant, August 2019.

[15] Interview, Gland workshop participant, January 2020.

[16] Interview, WCD Secretariat staff, September 2019.

appointed as Minister of Water Affairs, he famously joked that the only thing he knows about water is that he doesn't add any to his whiskey! […] he was a human rights person and so he approached the water board portfolio from very much a human rights perspective."[17]

The selection of the other Commissioners was less straightforward. The launch of the Commission had been scheduled for November 1997, but disagreements around the selection of Commissioners meant that it had to be delayed. The problem was one of balance between people who supported the building of large dams (e.g., from organisations like ICOLD, and the construction industry) and those against (e.g., activists from community-based organisations that campaigned against dams). One person involved in the selection of Commissioners commented: "We had people like John Briscoe from the World Bank on the one hand and Patrick McCully from IRN, International Rivers Network, on the other hand. They could hardly talk to each other, never mind come to an agreement on anything. So, I think we went through about 60 different nominations of people, and we had to toss those numbers around quite a lot…". The same respondent spoke of telephone conferences between Kader Asmal, George Greene from IUCN, and John Briscoe from the World Bank. They remembered "late-night calls that would go on for hours, [where] more than once John Briscoe would say, 'That's the end of it, we've hit the wall, this process is never going to work,' and Kader always used to say, 'Don't worry, it'll work, give it some time.'"[18]

Eventually, in January 1998 an emergency meeting was held in Cape Town, in which World Bank and IUCN staff were joined by stakeholders to finalise the process.[19] Twelve names were agreed upon there as Commissioners, to represent different stakeholder groups and world regions, and to include a range of attitudes towards dams, from pro-dam to anti-dam.[20] The overarching theme was to create a Commission that could claim to be sufficiently diverse so as to represent conflicts around dams through the life histories of its members. Such an approach was relatively unusual for a global commission at the time, which normally claimed to be detached and objective through recruiting "wise" elder statesmen (Dubash 2009). This might reflect the fact that the conflict around dams was much more than a disagreement around environmental policy and evidence, but had evolved into an (often violent) confrontation between warring factions.

In the end, four Commissioners came from civil society backgrounds: Medha Patkar, a well-known Indian anti-dam activist from the NBA; Joji Cariño, an indigenous activist who had begun her career as a journalist and activist in a struggle against four Danish-funded dams in indigenous territories of the Philippines, and was then working for the indigenous rights NGO Tebtebba Foundation; Deborah Moore, a scientist and member of the US-based NGO Environmental Defense Fund, with a focus on the environment impacts of dams; and Judy Henderson, an Australian paediatrician and then Chair of Oxfam International, with a focus on social issues, who had previously been involved in the campaign against the Franklin Dam in Tasmania, which was abandoned in the 1980s following intense public opposition (Baidya 1984; Petrow 2009).[21] The selection of four women from civil soci-

[17] Interview, Consultant/adviser to WCD Secretariat, April 2020.

[18] Interview, Consultant/adviser to WCD Secretariat, April 2020.

[19] The South African government was also involved in negotiations following the nomination of Kader Asmal as Chair.

[20] For a timeline of events, see: Dubash et al. (2001: 129).

[21] Although Judy Henderson was active in the anti-dam campaign, her role was comparatively minor; Interview, WCD Commissioner, September 2019.

ety backgrounds as Commissioners contrasted with the heavily male-dominated stakeholder workshop at Gland, where only two women had participated in a much larger group (Dubash et al. 2001). One interviewee suggested that in attempting to create a balanced and diverse Commission, gender was one of the criteria that was considered during the selection process. Subsequently, this shared background led to a strong sense of solidarity among the four women, in what continued to be a male-dominated field.[22]

Two Commissioners came from academia. One was Thayer (Ted) Scudder, an anthropologist at the California Institute of Technology, who studied the long-term impacts of dam-induced displacement and resettlement, with a particular focus on the Gwembe Tonga people displaced by the 1950s Kariba dam, located between Zambia and Zimbabwe (Leslie 2005). Scudder therefore came from a background in research on the negative impacts of dams but was recognised as a constructive critic of established dam planning procedures and outcomes; he had frequently worked as a consultant for the World Bank. He subsequently revised his stand and now advocates against the construction of new large dams.[23] José Goldemberg, a professor at the University of São Paulo specialising in energy and environment, came from a much more pro-dam position. As director of the São Paulo state energy company in the 1980s, his duties had included overseeing the construction of hydropower plants in the state and he had also been a member of the Brazilian federal government in the early 1990s. His participation was justified against the scepticism of representatives of the Brazilian anti-dam movement because of his academic credentials and practical experience.[24]

Practical expertise was also represented by Donald Blackmore, then Chief Executive of the Murray-Darling Basin Commission, a second Australian Commissioner. One interviewee noted that he was "the only dam owner on the Commission" and had worked for the World Bank in many different countries.[25] His experience of managing conflicts of interests around Australia's extremely scarce water resources made him a representative of the complex middle-ground, familiar with tense negotiations around water (Leslie 2005).

Finally, two Commissioners came from the dam construction industry: Jan Veltrop, an experienced engineer and former president of the International Commission on Large Dams (ICOLD), and Göran Lindahl, the Swedish CEO of the large engineering company ABB, which produced turbines for many large hydropower dams at the time. Both were moderately pro-dam in their attitudes and had great practical know-how, although they lacked experience with the politics of multi-stakeholder processes. One activist remembered Lindahl "once telling the NGO members, with a bit of pride, that within his sector he was now being called 'the human rights CEO.'"[26] And as one ICOLD representative recounted, civil society blocked the appointment of Kaare Høeg, a former ICOLD president, whereas he felt that his replacement, a fellow ex-president of ICOLD, Jan Veltrop, "defended our organisation very weakly and in this feeling [I] was supported by most national committees."[27]

[22] Interview, WCD Commissioner, August 2019.

[23] Compare Scudder (2001) and Scudder (2019), where he suggests that recent research on the (lacking) economic viability of large dams tilted the balance against large dams overall.

[24] Interview, WCD Forum member/observer, October 2019.

[25] Interview, WCD Commissioner, September 2019.

[26] Interview, WCD Forum member/observer, August 2019.

[27] Quote from the personal blog of Theo van Robbroeck (1931–2021), former ICOLD president (1994–1997), who was also a WCD Forum member and participant at the Gland workshop, see: van Robbroeck

The vice-chair of WCD was Lakshmi Chand Jain, who had been active in Indian social movements, including the anti-dam movement, before his nomination to several positions by the Indian government, including as High Commissioner to South Africa. He had also been a member of the Indian Planning Commission. A friend and colleague described him as a "Gandhian, […] not very enamoured by these large, what seem to be inhuman projects where the individual is not very important."[28] He and Patkar had closely worked together in the past; the strong representation of the Indian anti-dam movement on WCD correlated with the salience of the Indian anti-dam struggle on the world stage, but was a point of contention for the more pro-dam voices.

Achim Steiner was appointed as Secretary-General to lead the professional work of the Commission. Brazilian-born, Steiner had worked in the field of environment and development in several countries around the world, first for German development cooperation agency GTZ, then IUCN. At the time of appointment, he was Chief Technical Adviser to the Mekong River Commission and had coordinated the Gland workshop in 1997. His background made him a consensus candidate for the position between World Bank and IUCN. Permission was also sought from the German Federal Ministry of Economic Cooperation and Development (BMZ) who had sent him to Southeast Asia.[29] Many interviewees commented that his position with the WCD was an ideal preparation for his subsequent career, as Director General of IUCN (2001–2006), then Executive Director of UNEP (2006–2016) and Administrator of UNDP (2017-present).

The original list of Commissioners included Shen Guoyi, from the Chinese Ministry of Water Resources. However, she formally resigned in January 2000, and had had little engagement with the work of WCD until then. Her withdrawal may have been related to sensitivities around the construction of the Three Gorges Dam at the time,[30] as well as shifting policy priorities following a change in government that also affected the Ministry.[31] While the Chinese government was used to working with World Bank and IUCN, the experimental set-up of WCD and its many criticisms of large dams may have taken it by surprise. Her departure changed the balance between pro- and anti-dam voices. Shen Guoyi's departure left WCD with only 11 members. Achim Steiner was subsequently promoted to the status of full Commissioner, restoring it to the initial number of 12 members.

In addition to its 12 Commissioners, the WCD consisted of a Secretariat in Cape Town, and a Stakeholder Forum tasked with overseeing its work. The Secretariat had a central a role in WCD. An observer commented "The Secretariat became kind of a mini-commission in a sense, out of the limelight, but a lot of issues were worked out at the Secretariat level, and there was a lot of effort by Commissioners to make sure that the perspective they espoused was mirrored in the Secretariat."[32] Staff members had been recruited to represent various perspectives and sets of expertise, for example, on economics, engineering, resettlement issues, or ecology. Their previous knowledge, experience, and professional networks

(2015); the initial ICOLD appointee for WCD, Wolfgang Pircher, backed out due to his dissatisfaction with the financial compensation package for Commissioners and was replaced by Veltrop in September 1998, see: Dubash et al. (2001).

[28] Interview, Contributing report writer for WCD, January 2020.

[29] Interview, Consultant/adviser to WCD Secretariat, April 2020.

[30] Interview, WCD Commissioner, October 2019.

[31] Interview, WCD Secretariat staff, May 2019.

[32] Interview, WCD Forum member/observer, January 2020.

would often influence their work, and many lively debates took place among staff members as well; they were not "neutral bureaucrats" taking orders. The Secretariat was also heavily dominated by men, with women only working in communications and administration (with the exception of one temporary staff member who quit early).

The WCD Forum met three times, once in Prague, Czech Republic, in March 1999, and twice in South Africa (April 2000 and February 2001). Two of these meetings facilitated an exchange of ideas between various stakeholder groups, while the 2001 meeting had the purpose of discussing the dissemination of findings, taking place after WCD had officially been dissolved.[33] Forum meetings were a space for adversaries to interact and try to find common ground: "So the process, you know, this process of dialogue is not one of changing the extreme's opinion, it's to understand and to create a consensus area, where things are acceptable to most – which is what consensus is. People have a hard time understanding consensus; they think it means unanimity, it does not; it means a space where most people feel most comfortable. Which eliminates extremes."[34] While some interviewees shared anecdotes of learning and establishing respectful (and sometimes fiery) dialogue at the Forum, this remained an incomplete process, due to the larger number of participants and the limited number of meetings. Participants also noted that their input into the Commission's work was limited to giving relatively brief presentations and conversations with Commissioners. However, various stakeholder groups used them to coordinate their strategy and positions in informal meetings, in particular, global civil society.

Conclusions: ending or managing conflict?

The World Commission on Dams launched its final report in London on 16 November 2000, in the presence of former South African president Nelson Mandela and other well-known dignitaries and personalities. Despite its broad and varied work programme, many respondents considered this to be the principal achievement of WCD, the publication of a report that had been signed by all Commissioners. Most of those who attended the launch event, reported being deeply impressed by this experience, which they called "a wonderful achievement of Kader Asmal" and "a moment that until today gives goosebumps to everyone who was there […] something that not even Hollywood could have produced."[35] Perhaps the only drawback was that it coincided with the US presidential election drama, which drew all attention by the global press at the time (the WCD launch date had been purposely selected so as not to coincide with the US elections, but this plan was foiled due to the unforeseen delay in announcing a winner, see: Mebane Jr 2004).[36]

The high profile of the Final Report launch spoke of the ambition of the Commission's work. It emerged out of an extremely polarised situation; the conflict between dam supporters and opponents characterised its work throughout, from inception to the aftermath. These conflicts were openly acknowledged, and there was never any doubt that this was a political commission dealing with a primarily political, not technical, subject.

[33] The WCD Secretariat continued to work on dissemination until July 2001; it was then replaced by the Dams and Development Project at UNEP (UNEP DDP).

[34] Interview, WCD Forum member/observer, August 2019.

[35] Interviews, WCD Commissioners, September and October 2019.

[36] Interview, Contributing report writer for WCD, April 2020.

The first meeting between the Commissioners had taken place in Washington, DC, in May 1998, where Commissioners introduced themselves around their connection to dams: "You had someone like Joji Coriño […] speak about how she had spent years in prison for trying to protect her community from the San Roque dam project in the Philippines. To then Jan Veltrop talking about he was the engineer of this, this and this big dam project, and where he'd spent his life, living in the Middle East and other places. […] So it was just very profound."[37] This marked the beginning of an extraordinary international effort to assemble information about the planning of dams and their impacts. It was a process driven forward by a remarkable team of Commissioners, open to communication and negotiation across deeply entrenched battle lines.

There would be shoals and challenges ahead. Hearing the testimonies of people displaced by large dams while staying on good terms with the (often authoritarian) governments hosting the Commission proved difficult. The Commission was forbidden from holding its first stakeholder consultation event in India due to sensitivities around the Narmada Valley dams and had to shift to Sri Lanka at the last minute, in December 1998. The Government of China, while initially supportive of the WCD, cut all ties when they understood the radical vision and approach of the Commission, which was a significant drawback. The WCD had a very limited budget and much of its work was only made possible through continuous fundraising during its existence, causing significant uncertainty (Schulz and Adams 2020).

But the stage was set for a remarkable exercise in technical data collection, interdisciplinary communication, and grassroots engagement. The scope of the WCD was no less ambitious than the idea of overcoming such entrenched conflict. One Commissioner remarked: "I had never looked at the entire development debate through the prism of a single structure. We debated human rights, sustainability, etc. in the process of development. But here is a project, a physical object, whose inception and consequences allow us to lead the entire discussion on development."[38] The WCD received input from thousands of interested stakeholders, commissioned hundreds of reports, studies, and position papers, and sought to engage with people in every world region with large dams. Considering how limited it was in terms of budget, time, and numbers of people working for it, that was an impressive feat, enabled by pragmatism and idealism at once, as a staff member recalled: "We could move fast, we could move like lightning into a topic, and we controlled our money, and we could do what we wanted to get the job done. And then there was confidence and trust in how we did it."[39]

The Commission also managed, to some extent at least, to overcome the divisions between Global North and Global South, which had so long characterised conflicts around large dams. Despite its inception and the launch of its report in archetypally Northern settings, the WCD was strongly influenced by Southern perspectives, with the struggle around India's Narmada dams an important precursor. The fact that it was based in South Africa, held hearings with dam-affected people and others in several Southern countries, and that its Chair, Vice-Chair and several Commissioners were respected personalities from the Global South, are indicators of how seriously it took diversity and inclusion. Through the selection of five women as Commissioners, it also made an attempt to be conscious of gender

[37] Interview, WCD Commissioner, August 2019.

[38] Interview, WCD Commissioner, October 2019.

[39] Interview, WCD Secretariat staff, May 2019.

equality, though it is unclear whether it is a coincidence that four of them had a civil society background.

The Final Report, *Dams and Development*, provided both a summary of evidence of the benefits and costs of large dams, and by implication a critique of existing practices of dam planning, design, and operation. It contained an extensive list of guidelines and recommendations for best practice. It, too, was a product of the Commission's boldness in tackling, rather than hiding, divisions, perhaps best captured in the alternative titles discussed for it: "*Dams, Cost and Benefits?* and *Dams, Developer or Destroyer?*"[40]

The legacy of WCD has been mixed (Fujikura and Nakayama 2009). Some civil society actors found its work useful (Scodanibbio and Mañez 2005; Sneddon and Fox 2008), while others criticised it for not going far enough (Bello and Guttal 2006). Some governments (notably the European Union and Germany) adopted the Commission's recommendations as a standard for dam design (Neumann-Silkow et al. 2004; Seeger et al. 2010), while others disowned it (Biswas 2012). Some critics argued that the WCD's recommendations were impractical (Fujikura and Nakayama 2002) or too restrictive, suggesting that its guidelines would stop the construction of any large dam (despite repeated assertions that they were not intended to be mandatory) (Briscoe 2010; but see: Scudder 2019). The main associations representing the dam-building industry (the International Hydropower Association, IHA, the International Commission on Large Dams, ICOLD, and the International Commission on Irrigation and Drainage, ICID) criticised the Commission's choice of case studies as unrepresentative, but IHA subsequently sought to pick up the baton and develop improved procedures for dam planning (IHA 2020; Nakayama et al. 2002; Scheumann 2008). More recent research on dam building in East Africa also reports the return of high modernist thinking (albeit with some 21st century twists) among authoritarian governments, as well as dam planning failures, including inadequate compensation of those forcibly displaced (Abd Elkreem 2015; Dye 2019; Hänsch 2019; Verhoeven 2015), suggesting that the WCD's lessons have not had universal reach.

Whatever its legacies and impacts, the WCD stands out for its ambition and radical experimentation in seeking to end decades-old conflict around dams by simply making people meet, listen, read, and talk. Its inception marks a transition from an era of environmental conflict characterised by individual grassroots anti-dam campaigns, which were largely ignored by dam builders towards a new, more complex era in the global politics of dams and development, in which dam supporters and opponents may seek to find channels of communication that transcend simplistic "anti-dam" and "pro-dam" positions. The work of the World Commission on Dams formed a brief window in time in which conflicting parties met on a relatively equal footing, to explore their differences.

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[40] Interview, Consultant/adviser to WCD Secretariat, August 2019, quoting from an e-mail conversation with the WCD Secretary General.

References

Abd Elkreem T (2015) Whose dam? The danger of narrowly defined development: the case of Kajbar Dam, Northern Sudan. Mod Afr 3(1):95–111

Ackermann WC, White GF, Worthington EB (eds) (1973) Man-made lakes: their problems and environmental effects. American Geophysical Union, Washington DC

Adams WM (1992) Wasting the rain: rivers, people and planning in Africa. Earthscan, London

Adams WM (2020) Green development: environment and sustainability in a developing world, 4th edn. Routledge, London

Asmal K (2001) Introduction: World Commission on Dams report, *Dams and Development*. Am Univ Int Law Rev 16(6):1411–1433

Atkins E (2018) Building a dam, constructing a nation: the 'drowning' of Capel Celyn. J Hist Sociol 31(4):455–468

Baghel R, Nüsser M (2010) Discussing large dams in Asia after the World Commission on Dams: is a political ecology approach the way forward? Water Alternat 3(2):231–248

Baidya KN (1984) Anatomy of the Gordon-Franklin (Tasmania) dam controversy: socio-economic, political and environmental implications–a viewpoint. Int J Environ Stud 23(3–4):283–301

Baxter RM (1977) Environmental effects of dams and impoundments. Annu Rev Ecol Syst 8:255–284

Bello W (2007) The environmental movement in the Global South: the pivotal agent in the fight against global warming? Paper presented at the V International Media Forum for the Protection of Nature, Villa Mondragone – Monte Porzio, Rome

Bello W, Guttal S (2006) The limits of reform: the Wolfensohn era at the World Bank. Race Cl 47(3):68–81

Benincá D (2010) Água e energia para a vida: o Movimento dos Atingidos por Barragens no Brasil (1991–2009). Dissertation, Pontifícia Universidade Católica de São Paulo

Berger TR (1993) The World Bank's independent review of India's Sardar Sarovar projects. Am Univ J Int Law Policy 9(1):33–48

Bisht M (2008) Advocacy groups and multi-stakeholder negotiations: redefining frameworks of diplomatic practice. Int Stud 45(2):133–153

Biswas AK (2012) Impacts of large dams: issues, opportunities and constraints. In: Tortajada C, Altınbilek D, Biswas AK (eds) Impacts of large dams: a global assessment. Springer, Berlin, Heidelberg, pp 1–18

Bosshard P (2010) The dam industry, the World Commission on Dams and the HSAF process. Water Alternat 3(2):58–70

Briscoe J (2001) The World Commission on Dams: lessons learned about setting global standards. In: Gerrard CD, Ferroni M, Mody A (eds) Global public policies and programs: implications for financing and evaluation. Proceedings from a World Bank workshop. The World Bank, Washington DC, pp83–87

Briscoe J (2010) Overreach and response: the politics of the WCD and its aftermath. Water Alternat 3(2):399–415

Bromber K, de la Féaux J, Lange K (2014) The temporal politics of big dams in Africa, the Middle East, and Asia: by way of an introduction. Water Hist 6(4):289–296

Cariño J, Colchester M (2010) From dams to development justice: progress with 'free, prior and informed consent' since the World Commission on Dams. Water Alternat 3(2):423–437

Conca K (2002) The World Commission on Dams and trends in global environmental governance. Polit Life Sci 21(1):67–71

Crane J (2015) The environment in American history: nature and the formation of the United States. Routledge, London

Dalland Ø (1997) The last big dam in Norway: whose victory? In: Usher AD (ed) Dams as aid: a political anatomy of Nordic development thinking. Routledge, London, pp 41–56

Dasmann RF, Milton JP, Freeman PH (1973) Ecological principles for economic development. Wiley, Chichester

Dingwerth K (2003) Globale Politiknetzwerke und ihre demokratische Legitimation: eine Analyse der Weltstaudammkommission. Z Intern Bezieh 10(1):69–109

Dubash N (2009) Global norms through global deliberation? Reflections on the World Commission on Dams. Glob Gov 15(2):219–238

Dubash NK, Dupar M, Kothari S, Lissu T (2001) A watershed in global governance? An independent assessment of the World Commission on Dams. World Resources Institute, Lokayan, Lawyers' Environmental Action Team, Washington DC
Dwivedi R (1998) Resisting dams and 'development': contemporary significance of the campaign against the Narmada projects in India. Eur J Dev Res 10(2):135–183
Dye B (2019) Dam building by the illiberal modernisers: ideology and changing rationales in Rwanda and Tanzania. FutureDAMS Working Paper 005. The University of Manchester, Manchester
ERN = European Rivers Network (1997) Declaration of Curitiba: affirming the right to life and livelihood of people affected by dams. ERN. https://www.rivernet.org/general/movement/curitiba.htm Accessed 7 October 2021
Farvar MT, Milton JP (eds) (1973) The careless technology: ecology and international development. Stacey, London
Fernea RA, Kennedy JG (1966) Initial adaptations to resettlement: a new life for Egyptian Nubians. Curr Anthropol 7(3):349–354
Fox JA (1998) When does reform policy influence practice? In: Fox JA, Brown LD (eds) The struggle for accountability: the World Bank, NGOs and grassroots movements. MIT Press, Cambridge, MA, pp 303–344
Fox JA, Brown LD (eds) (1998) The struggle for accountability: the World Bank, NGOs and grassroots movements. MIT Press, Cambridge, MA
Fujikura R, Nakayama M (2002) Study on feasibility of the WCD guidelines as an operational instrument. Water Resour Dev 18(2):301–314
Fujikura R, Nakayama M (2009) Lessons learned from the World Commission on Dams. Int Environ Agreem 9(2):173–190
Galambos J (1993) An international environmental conflict on the Danube: the Gabcikovo-Nagymaros Dams. In: Vari A, Tamas P (eds) Environment and democratic transition: policy and politics in Central and Eastern Europe. Springer, Dordrecht, pp 176–226
Gandhi A (2003) Developing compliance and resistance: the state, transnational social movements and tribal peoples contesting India's Narmada project. Glob Netw 3(4):481–495
Goldman M (2005) Imperial nature: the World Bank and struggles for social justice in the age of globalization. Yale University Press, New Haven, CT
Goldsmith E (1987) Open letter to Mr Conable, President of the World Bank. Ecologist 17(2/3):58–61
Goldsmith E, Hildyard N (1984) The social and environmental impacts of large dams, volume 1: overview. Wadebridge Ecological Centre, Wadebridge, Cornwall
Gonzalez N (1972) The sociology of a dam. Hum Organ 31(4):353–360
Goodland R (2010) The World Bank versus the World Commission on Dams. Water Alternat 3(2):384–398
Goodland RJ (1984) Environmental requirements of the World Bank. Environment and Science Unit, Projects Policy Department, World Bank, Washington DC
Goodland RJA (1990) Environment and development: progress of the World Bank. Geogr J 156(2):149–157
Hänsch V (2019) Der Entwicklung trotzen: ein Megastaudammprojekt im Nordsudan und der lokale Widerstand gegen Vertreibungen. Peripherie 39(154/155):216–243
Holden C (1987) World Bank launches new environment policy. Science 236(4803):769
Holdgate MW (1999) The green web: a Union for World Conservation. Earthscan, London
ICOLD = International Commission on Large Dams (1980) Dams and their environment. ICOLD, Paris
ICOLD (1981) Dam projects and environmental success. ICOLD, Paris
IHA = International Hydropower Association (2020) Hydropower Sustainability Assessment Protocol. IHA, London
Iyer RR (2001) World Commission on Dams and India: analysis of a relationship. Econ Polit Wkly 36(25):2275–2281
Johnston BR, Garcia-Downing C (2004) Hydroelectric development on the Bío-Bío River, Chile: anthropology and human rights advocacy. In: Blaser M, Feit HA, McRae G (eds) In the way of development: indigenous peoples, life projects and globalization. Zed Books, London, New York, pp 211–231
Kennedy VW (1988) Environmental impact assessment and bilateral development aid: an overview. In: Wathern P (ed) Environmental impact assessment: theory and practice. Unwyn Hyman, London, pp 272–282
Khagram S (2004) Dams and development: transnational struggles for water and power. Cornell University Press, Ithaca
Leslie J (2005) Deep water: the epic struggle over dams, displaced people, and the environment. Farrar, Straus and Giroux, New York
Lövgren L (1997) Moratorium in Sweden: an account of the dams debate. In: Usher AD (ed) Dams as aid: a political anatomy of Nordic development thinking. Routledge, London, pp 21–30
Lowe-McConnell RH (ed) (1966) Man-made lakes. Institute of Biology and Academic Press, London

McCully P (1996) Silenced rivers: the ecology and politics of large dams. Zed Press, London
McCully P (2001) The use of a trilateral network: an activist's perspective on the formation of the World Commission on Dams. Am Univ Int Law Rev 16(6):1453–1475
Mebane WR Jr (2004) The wrong man is president! Overvotes in the 2000 presidential election in Florida. Perspect Polit 2(3):525–535
Moore D, Dore J, Gyawali D (2010) The World Commission on Dams + 10: revisiting the large dam controversy. Water Alternat 3(2):3–13
Moore D, Sklar L (1998) Reforming the World Bank's lending for water: the process and outcome of developing a water resources management policy. In: Fox JA, Brown LD (eds) The struggle for accountability: the World Bank, NGOs and grassroots movements. MIT Press, Cambridge, MA, pp 345–390
Moraes Corrêa SR (2019) O Movimento dos Atingidos por Barragens: interpelando o debate do desenvolvimento no Brasil e na Amazônia. Revista de Ciências Sociais 50(3):423–467
Mossallam A (2014) "We are the ones who made this dam 'High'!" A builders' history of the Aswan High Dam. Water Hist 6(4):297–314
Nakayama M, Fujikura R, Yoshida T (2002) Japanese experiences to enhance the World Commission on Dams guidelines. Hydrol Process 16(11):2091–2098
Navalawala BN (2001) World Commission on Dams: biased? Econ Polit Wkly 36(12):1008–1010
Nesti L (2002) The Mapuche-Pehuenche and the Ralco Dam on the Biobío River: the challenge of protecting indigenous land rights. Int J Minor Group Rights 9(1):1–40
Neumann-Silkow F, Hellstern E, Brühl H (2004) Implementation of the WCD recommendations within German development cooperation: experiences of GTZ and KfW. GTZ, Eschborn
Nilsson C, Reidy CA, Dynesius M, Revenga C (2005) Fragmentation and flow regulation of the world's large river systems. Science 308(5720):405–408
Obeng LE (ed) (1969) Man-made lakes: the Accra Symposium. Ghana University Press, Accra
Ottaway M (2001) Corporatism goes global: international organizations, nongovernmental organization networks, and transnational business. Glob Gov 7(3):265–292
Pandey P (2015) Track II – Nepal's pluralistic hydropower development post-Arun. Stud Nepali Hist Soc 20(2):335–349
Petrow S (2009) Saving Tasmania? The anti-transportation and Franklin River campaigns. Tasman Hist Stud 14:107–136
Picciotto R (1997) Opening statement. In: Dorcey T, Steiner A, Acreman M, Orlando B (eds) Large dams: learning from the past, looking at the future. Workshop proceedings. IUCN, World Bank Group, Gland, Cambridge, Washington DC, pp 130–133
Qing D, Sullivan LR (1999) The Three Gorges Dam and China's energy dilemma. J Int Aff 53(1):53–71
Ramsar Convention (2021) History of the Ramsar Convention. Ramsar Convention. https://www.ramsar.org/about/history-of-the-ramsar-convention Accessed 7 October 2021
Ranjan A (2018) Anti-dam protests in India: examining the profile of the Sardar Sarovar Dam. New Water Policy Pract J 4(2):75–94
Rich B (1994) Mortgaging the Earth: the World Bank, environmental impoverishment and the crisis of development. Beacon Press, Boston
Saklani U (2021) Anti-dam struggles and the technopolitics of hydropower: the case of Arun-III in Nepal. FutureDAMS Working Paper 017. The University of Manchester, Manchester
Scheumann W (2008) How global norms for large dams reach decision-makers: a case study from Turkey. In: Scheumann W, Neubert S, Kipping M (eds) Water politics and development cooperation: local power plays and global governance. Springer, Berlin, Heidelberg, pp 55–80
Schultz B (2002) Role of dams in irrigation, drainage and flood control. Water Resour Dev 18(1):147–162
Schulz C, Adams WM (2019) Debating dams: the World Commission on Dams 20 years on. Wiley Interdiscip Rev Water 6(5):e1396
Schulz C, Adams WM(2020) The World Commission on Dams: then and now. FutureDAMS, University of Cambridge. https://doi.org/10.17863/CAM.60152 Accessed 7 October 2021
Schulz C, Adams WM (2021) In search of the good dam: contemporary views on dam planning in Latin America. Sustain Sci 16(1):255–269
Scodanibbio L, Mañez G (2005) The World Commission on Dams: a fundamental step towards integrated water resources management and poverty reduction? A pilot case in the Lower Zambezi, Mozambique. Phys Chem Earth 30(11–16):976–983
Scudder T (1973) The human ecology of big projects: river basin development and resettlement. Annu Rev Anthropol 2:45–55
Scudder T (2001) The World Commission on Dams and the need for a new development paradigm. Water Resour Dev 17(3):329–341
Scudder T (2005) The future of large dams: dealing with social, environmental, institutional and political costs. Earthscan, London

Scudder T (2019) Large dams: long term impacts on riverine communities and free flowing rivers. Springer Nature, Singapore
Seeger C, Nyman K, Twum R (2010) The role of the German development cooperation in promoting sustainable hydropower. Water Alternat 3(2):453–462
Sengupta N (2001) World Commission on Dams: biased if misread. Econ Polit Wkly 36(19):1647–1649
Shah E, Vos J, Veldwisch GJ, Boelens R, Duarte-Abadía B (2021) Environmental justice movements in globalising networks: a critical discussion on social resistance against large dams. J Peasant Stud 48(5):1008–1032
Sneddon C, Fox C (2008) Struggles over dams as struggles for justice: the World Commission on Dams (WCD) and anti-dam campaigns in Thailand and Mozambique. Soc Nat Resour 21(7):625–640
Stein RE, Johnson B (1979) Banking on the biosphere? Environmental procedures and practices of nine multilateral aid agencies. Lexington Press, New York
Swayamprakash R (2014) Exportable engineering expertise for 'Development': a story of large dams in post independence India. Water Hist 6(4):153–165
Thabane M (2000) Shifts from old to new social and ecological environments in the Lesotho Highlands Water Scheme; relocating residents of the Mohale Dam area. J South Afr Stud 26(4):633–654
Thatte CD (2001) Aftermath, overview and appraisal of past events leading to some of the imbalances in the report of the World Commission on Dams. Water Resour Dev 17(3):343–351
Tortajada C (2016) Nongovernmental organizations and influence on global public policy. Asia Pac Policy Stud 3(2):266–274
Usher AD (ed) (1997) Dams as aid: a political anatomy of Nordic development thinking. Routledge, London
Usher AD (1997) The mechanism of 'pervasive appraisal optimism'. In: Usher AD (ed) Dams as aid: a political anatomy of Nordic development thinking. Routledge, London, pp 59–75
The International Rivers Network (1996) Organization summary: the International Rivers Network. Colo J Int Environ Law Policy 7(2):409–416
The World Bank Group Oral History Program (2005) Transcript of oral history interview with Robert Goodland held on January 26, 2005. The World Bank Group, Washington DC. Report No. 95455
van Robbroeck T(2015) Water engineering: memories of a career in water engineering and management. International Commission on Large Dams. Lieberheim Blogspot. http://lieberheim.blogspot.com/p/blog-page_33.html Accessed 7 October 2021
Vainer C (2009) Water for life, not for death: the Brazilian Social Movement of People Affected by Dams. In: Deere CD, Royce FS (eds) Rural social movements in Latin America: organizing for sustainable livelihoods. University Press of Florida, Gainesville, pp 163–188
Verhoeven H (2015) Water, civilisation and power in Sudan: the political economy of military-Islamist state building. Cambridge University Press, Cambridge
Warren MW, Rubin N (eds) (1968) Dams in Africa: an inter-disciplinary study of man-made lakes in Africa. Frank Cass, London
Watson C (1985) Working at the World Bank. In: Hayter T, Watson C (eds) Aid: rhetoric and reality. Pluto Press, London, pp 268–275
WCD = World Commission on Dams (2000) Dams and development: a new framework for decision-making. Earthscan, London, Sterling, VA
Wood JR (1993) India's Narmada River dams: Sardar Sarovar under siege. Asian Surv 33(10):968–984
World Bank (1984) Environmental policies and procedures of the World Bank. Office of Environmental and Health Affairs, World Bank, Washington DC

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