

Decision-making in the Murray–Darling Basin

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31.1 Introduction

The Murray–Darling Basin, particularly in the south, is in a parlous state. Why? Drought is part of the answer, but there is widespread consensus among water policy makers, managers, researchers, and the general public that human pressures in their many forms have also played a crucial role. This is despite nearly a century of management involving five governments – the Commonwealth, New South Wales, Victoria, South Australia, and more recently Queensland – which has frequently been described as ‘world’s best practice’. What went wrong? That question can lead in many directions. In this chapter the focus is on just one of them: the failure to put in place a decision-making process at the top of the institutional pyramid that could, from a basin-wide perspective, make and enforce major decisions about core issues. Significantly, the need (and the risks involved in not creating that capacity) was recognised as a key issue in each of the three major phases of institutional design and reform: first during the early decades of the twentieth century, second in the 1980s, and now with the Commonwealth Water Act 2007 and the MD Basin Plan.

The Murray–Darling Basin (MDB) is a large, complex region. It is just over a million square kilometres in size, has a diverse range of landscapes, ecosystems, land uses, and climates, includes over 30 000 wetlands, 11 of which are listed under the Ramsar Convention of Wetlands of International Importance, and produces approximately 40 percent of Australia’s gross value of agriculture. Divided between the southern and eastern Australian states of New South Wales, Victoria, South Australia, and Queensland, and including the Australian Capital Territory – each of whose governments has their own system of water entitlements and management – the MDB is home to just under 2 million people and supplies much of the water used by another 1 million in South Australia. Those 3 million people and various industrial activities use about 4% of the water diverted from the region’s rivers. The other 96 percent is used by irrigated agriculture¹ (Blackmore, 2002: 7).

Managing the hydrological assets upon which these riches depend is difficult. As is the case with many rivers that cross state or provincial borders within federal political systems, water policy and management in the MDB is characterised by considerable

Water Resources Planning and Management, eds. R. Quentin Grafton and Karen Hussey. Published by Cambridge University Press. © R. Quentin Grafton and Karen Hussey 2011.

intergovernmental and interagency conflict, low decision-making transparency or accountability, high transaction costs, and ad hoc deals, all of which undermine best practice water management. As with other large hydrological systems that span political borders, the MDB is highly exposed to the risks attached to what are known as 'open access' resources. In 1968, Garrett Hardin published a short paper titled *The Tragedy of the Commons* in which he argued that it was difficult to restrain over-exploitation of common resources such as shared pastures, fish, and water (Hardin, 1968). Critics subsequently nominated many examples of successful management of natural resource systems owned in common, and suggested that his thesis was more applicable to open access resources which lack any effective overarching institutional framework able to control or regulate users' behaviour. In the case of an open access resource, it is in the interests of each individual user to expand their own consumption as much as possible because any restraint will only increase the amount available for their competitors. The eventual result is the complete destruction of the resource to the disadvantage of everybody. That is the development path currently being travelled by most large international hydrological systems and, until the MD Basin Plan, that had been true of the MDB.

The classical response to this threat is to introduce a systems approach which will establish monitoring and accountability frameworks that cross both political and institutional borders. Without such a systems framework, costs can be exported to other jurisdictions, typically downstream, to other sections of society, or to future generations (and this generation in the future). To counter such threats in the MDB, the National Water Initiative mandated a 'whole of hydrological systems' approach to policy and management. This is made clear in many sections of the NWI. It requires 'the return of all currently over allocated or overused systems to environmentally sustainable levels of extraction' and 'recognition of the connectivity between surface and groundwater resources and connected systems managed as a single resource' (NWI 23 iv, x in NWC, 2004). Similarly, the planning framework is to 'implement firm pathways and open processes for returning previously over allocated and/or overdrawn surface and groundwater systems to environmentally sustainable levels of extraction' (NWI 25 v in NWC, 2004). This has many implications, one of the most obvious being that managing the MDB as a number of largely autonomous sub-catchments matching state borders – still the situation in the MDB – is fundamentally incompatible with the NWI.

31.2 Early twentieth century: the first phase of cross-border institutional design

The need for comprehensive policy coordination in the River Murray catchment (inclusion of the central and northern regions of the MDB drained by the River Darling only came about in the 1980s) was well recognised by the writers of the Australian constitution and the decision-makers who designed the first generation of cross-basin arrangements in the early decades of the twentieth century. To deal with difficult issues involving conflicts between the states, the Australian Constitution included a quasi-judicial body, the Interstate

Commission. Resolution of disputes over the River Murray was one of its priority tasks. According to legal researcher Sandford Clark, the River Murray Waters Agreement and the River Murray Commission (respectively, the intergovernmental agreement and the organisation that managed cross-border water issues in the southern MDB until the 1980s) were designed to operate in combination with the Interstate Commission (Clark, 1983: 159–161; 2002: 21). The legislation establishing the Interstate Commission had a number of broad-ranging clauses describing the scope of the Commission's powers to deal with river issues. This included the capacity to initiate actions at its own behest, accept references from elsewhere, award damages and issue injunctions. In Clark's opinion (*ibid.*):

The Interstate Commission was in a position not merely to arbitrate upon the quantitative and qualitative entitlements of the respective states to water in the main stem of the Murray but also to control and prevent more blatant acts of selfishness by the upstream states on tributary rivers. On this assumption it was entirely appropriate that the River Murray Waters Agreement should be confined to the main stem of the Murray where the cooperative financing and construction of storages and locks was to occur, thereby facilitating the regulated delivery of agreed monthly flows to South Australia.

These plans were frustrated, however, by a High Court decision in 1915 that stripped the Interstate Commission of most of its powers. According to Clark, writing from the perspective of the 1970s, without the Interstate Commission 'the River Murray Waters Agreement was a totally inadequate vehicle to impose a management regime for the whole Basin' (Clark, 1971: 237).

Partly in response to these setbacks, the state premiers agreed to a number of important changes to the River Murray Waters Agreement when they met in May and July 1920. They decided that the River Murray Commission should be a corporate body, directly responsible for the construction of all the works planned under the Agreement and the owner of any required engineering plant. Even more intriguing, they agreed to change the voting system for the Commission so that a 3 out of 4 majority would be sufficient rather than the unanimous approval previously required for all major decisions. This last proposition was rejected by the New South Wales parliament, thereby aborting all the amendments approved earlier by the premiers (Eaton, 1945: 17). Writing about this episode in 1945, J. H. Eaton, South Australian River Murray Commissioner since 1918, explained that the proposals for changes to the RMWA were designed to reduce the potential for obstruction and delays under the established arrangements (which were not dissimilar to those still in place today). Despite nearly 30 years of subsequent experience as a commissioner, he never suggested those fears were unfounded. According to Eaton, the situation was most difficult at Hume Dam where there was 'a certain lack of co-ordination in the matter of plant, wages and general conditions and some overlapping in supervision, purchase of stores etc'. In his careful way, Eaton describes the 1920 amendments as an attempt to remedy what was 'believed to be a weakness' (Eaton, 1945: 21).

After the proposed changes were rejected by the NSW parliament, the work at Hume Dam was undertaken independently by the two state construction authorities, each responsible for constructing its section of the dam on its side of the border. Hume Dam now

holds over 3000 gigalitres (GI) when full and sits just upstream from Albury, one of the largest rural towns in Australia. In August 1996, there was ‘movement’ in the dam wall that caused the Murray–Darling Basin Commission to immediately release a large volume of water because of fears it might collapse. The fault occurred at the point where the two independent construction projects joined together (MDBC, 1996: 55–57). It is interesting to consider whether this weakness would have been incorporated into a design prepared by a single constructing authority unconcerned with maintaining two autonomous building projects on each side of the border, as was proposed by the premiers in 1920.

At the very least this episode highlights the dangers that can come from managing the MDB as four separate sub-basins arbitrarily divided by political boundaries that take little account of hydrological realities. Looking more broadly, it can be argued that the MDB’s current crisis was in large part created by failure to put in place the original plans for cross-border river management. Because of the lack of a decision-making forum, such as the Interstate Commission, development in the MDB evolved around the four largely autonomous policy nodes based in the four state capitals. As is always the risk with open access resources, none of the three up-river states have had an interest in restraining the growth of irrigation stakeholders for the benefit of other stakeholders downstream, outside their borders. Through the twentieth century, these four state-focused irrigation sectors have expanded and become dependent on unsustainable over-allocations that they continue to defend. So far, as of 2009, that defence has been successful, despite the release of a succession of major policy documents over the past 20 years, agreed to unanimously by all six governments with MDB responsibilities, which have stated that there should be major reductions in the proportion of river flow going to irrigation in favour of the environment.

31.3 The 1980s: the second attempt to create a strong decision-making system

By the early 1970s, increasing irrigation development was causing serious salinity problems in the middle and lower reaches of the River Murray. In response, cross-border arrangements were restructured in the 1980s. The new framework was incorporated in a revised MDB Agreement that for the first time included Queensland and the Australian Capital Territory, although not as full members. Key elements were the Murray–Darling Basin Ministerial Council, the Community Advisory Committee to the Ministerial Council, and the Murray–Darling Basin Commission. All three bodies were supported by the Commission Office. The reforms reflected changing ideas about how public institutions should be organised and operated. There was a wide-spread feeling that decision-making could no longer be left to small groups of engineers who had spent their careers dealing mainly with water resource infrastructure. Under the new institutional arrangements, the Basin’s river system was to be managed to improve biodiversity and sustainability as well as production. The state and Commonwealth governments sent teams of ministers and senior public servants drawn from agencies that dealt with often conflicting responsibilities – production and the environment. This brought the environment and agriculture into the institutional fold, along

with water management. The rationale for the changes was stated at the head of the revised agreement:

The purpose of this Agreement is to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray–Darling Basin (Commonwealth Parliament, 1993).

In principle, given the inclusion of at least two ministers from each of the governments represented on the MDB Ministerial Council, the new arrangements should have been able to make decisions about all the major issues such as salinity and over-extraction. However, most of the activities incorporated into the new agreement were advisory or discretionary in nature, and needed the enthusiastic cooperation of all governments and agencies involved before they could be implemented in any significant way. This applied particularly to activities outside the River Murray corridor. In addition, the long-established unanimity principle still applied to all decision-making processes, giving the power of veto to any jurisdiction that wanted an item excluded from the agenda or which was dissatisfied with any decision made. Despite these limitations, however, the early years of the MDB Initiative were marked by widespread enthusiasm and considerable achievement.

One of the most notable successes was the Salinity and Drainage Strategy introduced in 1989. The aim was to produce a significant drop in net average salinity levels in the Murray as measured at Morgan in South Australia, and to manage flows so as to avoid the short but severe spikes in salinity levels that periodically caused considerable damage to irrigation in the lower Murray (MDBC, 1999). Planning was assisted by computer technology that became available in the 1970s and made it easier for planners to compare the costs and benefits of alternative proposals. Once negotiations between the states finally got under way, agreement on the broad outline of the strategy was reached fairly quickly. As well as a number of management changes to reduce evaporation from storages, the new strategy allowed some additional saline drainage to flow to the river in Victoria and New South Wales from new irrigation developments there. In return, those states and the Commonwealth invested in groundwater interception works in the middle and lower reaches of the river, mainly in South Australia, where the greatest salinity reduction benefits could be obtained.

An important part of the Salinity and Drainage Strategy was agreement by all three southern MDB states to not grant any further water entitlements. Only continued development using existing entitlements was allowed. Banning new entitlements was seen as a way to control the salinity impacts of new irrigation development, and also as a strong restriction on any future expansion in the volume of water that could be taken from streams and rivers in the southern MDB. (Additional water extracted for irrigation would result in additional salinity impacts which were now capped.) What was not realised was the extent of unused entitlements, especially in New South Wales. These subsequently became known as sleeper and dozer licences.

Within a few years, concern about continued growth in extractions caused the MDB Ministerial Council in 1995/6 to introduce ‘the Cap’ on surface water extractions in

response to a water audit that highlighted the unused potential expansion hidden in sleeper and dozer licenses. The MDB Cap was always intended as only an interim measure to halt further growth while the necessary extent of reduction to restore the river system was being worked out. This was stated in the original documents and in the annual reports of the Independent Audit Group which reported yearly on its implementation. The need for substantial further reduction was spelt out in detail in the five-year review of Cap implementation commissioned in 2000.

In response to the continued decline revealed by the five reviews, the MDB Ministerial Council approved 'The Living Murray' project in 2004. Early in the planning phase for that project, the Ministerial Council established a scientific reference panel to advise about the potential benefits of a range of rehabilitation options. Six scenarios were tested by the panel against the probability that they would restore the River Murray to a condition that could be described as that of 'a healthy working River Murray system'. The first three: do nothing, improved operations only, and improved operations plus 340 GI for new environmental flows, were all considered to have a 'low' probability of success. Improved operations plus 750 GI, was given a 'low–moderate' rating. For improved operations and 1630 GI, the probability was 'moderate'. Only 3350 GL plus improved operations was rated 'high'. Eventually in June 2004, \$500 million was approved for use on six sites along the River Murray. Subsequently, in a series of steps, it was agreed the Commonwealth would fund the purchase of 500 GI for six icon sites.

The Living Murray project was a very significant improvement on what was happening before, but its dimensions are nowhere near what was required to match the level of deterioration that was identified by the five-year review and subsequent studies. This is acknowledged by its official title 'The Living Murray first step decision'. Discussions about what would come later were so vague, however, that it cannot be said that there was anything like a commitment to a second step. This is of particular concern because the Living Murray project is being implemented within a context of continuing environmental decline and no stable situation. The inadequacy of the Living Murray, compared to what is needed to achieve stability, is indicated by the fact that its approval required the abandonment of the system-wide approach that is central to the NWI (NWI 23, 28–57, Schedules A & E, in NWC, 2004). Details about how the Living Murray first step decision was to be implemented were released by COAG as part of its NWI launch. To be compliant with the NWI, the Ministerial Council needed to be able to claim that the best available scientific advice had confirmed that its new policy would make the MDB environmentally sustainable at some stage in the future. Although it may be wrong, the only scientific advice that had been obtained by the Ministerial Council concluded that only 3350 GI plus management changes, or at the very least 1630 GI plus management changes, could achieve that condition. In the event, discussion about whether 500 GI would be enough are largely immaterial because it has not yet proven possible to accumulate even that relatively small amount (Connell, 2007: 166–73).

The Salinity and Drainage Strategy, the Cap on surface water extractions, and the Living Murray project were direct attempts to reduce extractions to sustainable levels. More general, but also more ambitious (in that they were designed to achieve environmental

sustainability in the MDB through comprehensive change in management practices), were the 1990 Natural Resources Management Strategy (NRMS) and the Integrated Catchment Management Policy Statement approved in 2001. The NRMS was the product of considerable preparation. Soon after the MDB Ministerial Council was formed in 1986, it commissioned a series of studies to provide the necessary knowledge and sketch a new approach to implementation which would support a substantial expansion of interjurisdictional activities. Brought together as the Murray–Darling Basin Environmental Resources Study, the project summarised existing information, identified knowledge gaps, documented the locations of environmental resources that required special protection, recommended actions needed to protect these resources, and nominated further investigations. It also specified the requirements needed for a Basin-wide monitoring program, given that lack of quantitative data was a 'major constraint' on effective policy and management. After noting that 'integrated catchment management with strong community involvement will need to be a fundamental strategy', the study proposed comprehensive action to deal with issues related to agricultural land resources, climate change, vegetation, groundwater, flora and fauna, aquatic and riverine environments, water quality, water allocation, water use efficiency, riverine regions, cultural heritage, tourism, and recreation (MDBMC, 1987: iv).

The resources study was the precursor of the Natural Resources Management Strategy (NRMS) adopted by the Ministerial Council in August 1990. The NRMS was to:

- prevent further degradation
- restore degraded resources
- promote sustainable user practices
- ensure appropriate resource use planning and management
- ensure a long-term, viable economic future for Basin dependents
- minimise adverse effects of resource use
- ensure community and government cooperation
- ensure self-maintaining populations of native species
- preserve cultural heritage
- conserve recreational values (MDBMC, 1990: 8).

In its effort to chart a comprehensive response to ongoing decline, the NRMS was a precursor to the 2007/8 Basin Plan. It outlined a comprehensive view of the problems of the MDB and provided an overarching justification for many projects, both specific and general. What did not happen, despite strong statements that this was required, was the development of a program of activities that matched the extent and dimensions of the problems that had been identified. In the following years there were Herculean efforts to overcome this gap, but attempts to devise middle-level plans for the range of issues of concern were continually frustrated.² Instead, the result was an ad hoc list of projects justified in a general way as contributing to 'improved sustainability', vaguely defined. Despite enormous effort, the question of how to match the activities and projects that were actually approved to the size of the proclaimed overall task has dogged interjurisdictional policy making in the MDB ever since.

Through the 1990s, references to the NRMS became progressively less frequent and it eventually faded from corporate memory. The need for a high-level response to the general decline in environmental conditions and to resource security continued, however, and subsequently, in 2001, the MDB Ministerial Council approved the Integrated Catchment Management Policy Statement (MDBMC, 2001). Some policies define long-term goals, with the intention of creating pressure to work out how to implement them (an example was President Kennedy's goal to put a man on the moon); others are designed to make incremental improvements that build on what already exists. The ICM Policy Statement is an example of the former (as is also the National Water Initiative). It is what is sometimes called a 'stretch' strategy – one that is not achievable with existing institutions, social attitudes, or science but which is meant to provide the stimulus to acquire that capacity (Yencken and Wilkinson, 2000: 11–13). The ICM policy statement was to be the framework for all other strategies being implemented in the Basin. This rather millenarian document (in its commitment to behaviour change on the part of governments and commissioners) included a statement that over the next 10 years communities and their governments would set measurable targets for water quality, water sharing, riverine ecosystem health, and terrestrial biodiversity.

In June 2001, with considerable fanfare, the ICM Policy Statement was unanimously adopted by the Ministerial Council. The 2002/3 MDBC annual report, however, soon showed that the new overarching policy was being quietly sidelined. The description of its implementation, just one year after its introduction, took up less than two pages, with much of that space spent discussing the programs that have effectively displaced it (albeit with no hint of conflict between them) (MDBC, 2003, 2004). The MDBC annual report for 2003/4 reduced that coverage to half a page. It referred to a recent publication that provided 'a snapshot of ICM implementation' and listed a number of activities going on throughout the MDB that will contribute to improved catchment health. Some of these apparently involve the development of targets of some sort, but there was no discussion of what they were, the processes used to develop them, and no directions as to where such information can be obtained. The report conceded that the achievements described 'were not necessarily in the direction and in the same way as envisaged under the ICM policy'.

31.4 What went wrong?

In 2004 Peter Cullen, a long-time member of the MDB Community Advisory Committee and the Wentworth Group, and one of the foundation commissioners of the National Water Commission, reflected on the fate of the 1980s MDB reforms in an interview for the National Library. He said:

In the early years after the reforms of the mid 1980s the Ministerial Council was persuaded to commission a series of major investigations whose results created strong pressure for change. Although this approach caused political pain in the states they reluctantly went along with it because of the growing public demand for action to reverse continuing degradation. It was a very good strategy.

The states were uncomfortable with it but were wearing it. It could have been made to work if the Commonwealth Government had given its support. Instead it took the view that the Commission (to a large extent meaning the Commission Office) was usurping its role and it was not prepared to allow that to happen. Commonwealth ministers and commissioners felt that it was they who should coordinate and lead change in the Basin. So the federal government undermined the Commission by channeling the new money for natural resources through the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality, direct to the state agencies rather than through the multi-government process provided by the Commission.

This set up an unholy alliance between the Commonwealth and the state governments in which both for their own reasons were happy to disempower the Commission. As a result you had billions of dollars going to natural resources but not through a coordinating body. This was unfortunate because when the money went through the Commission you had all the governments over-viewing each others investments and they were able to act as a quality control on each other. Under the new arrangement the Federal government negotiates one by one with each of the states and it lacks the knowledge and experience to effectively scrutinise what each state proposes. As a result the states have been able to take advantage of the situation and run their own agendas. We now have much less scrutiny on the spending than we had when all the governments were sitting around the table. We got so close to getting it right in the MDB but that power relationship undermined it.³

The question now is: will the new institutional arrangements introduced through the Commonwealth Water Act 2007/8 create a different pattern of interactions between the governments of the MDB that will produce better outcomes than in the past?

31.5 Now: the third attempt

The current reform program as brought together in the Commonwealth Water Act 2007/8 is based on the National Water Initiative. Its various sections provide a check-list of most of the major issues that have shaped the history of water management in the various states over the past century. The NWI has its faults – there is not much discussion about water quality issues, or the complexities involved in managing water in combination with the many other interacting aspects of the catchment (such as biodiversity) – but overall it is an ambitious and impressive document, particularly given that it had to survive the critiques of nine governments and many interest groups before being approved. The NWI combines recognition of the enormous economic benefits to be gained from water together with an emphasis on the need to make the overall management regime sustainable, thereby protecting the interests of future users (broadly defined) and current users in the future. It also shows awareness that, to protect economic benefits, the water management regime must be accepted by the wider community. This means that other claims – environmental, social, cultural, aesthetic, and religious, in addition to those with an economic base – must be taken into account if economic activity and water management are to be conducted in a politically stable environment.

The National Water Initiative reflects a changing relationship between governments, public water authorities, and private water users (principally irrigators) after more than

a century of relative stability. For many decades the interests of governments and water users were very similar. Governments used water as a tool to promote the growth of communities and there was little concern about environmental issues. In more recent times this congruence of interests has broken down as serious environmental problems emerged. The NWI signalled a change in the role of governments. Instead of being the promoters of development (as they had been for a century or more) they are now supposed to become the adjudicators of conflicts between competing interests.

As described in this chapter there have been a number of attempts to respond to these threats and each in turn has withered through neglect in the implementation phase. Initially it seemed that the NWI was going to suffer the same fate. The decisive factor which broke the log-jam in the MDB was the increasing intensity of drought in the southern section of the catchment. In response to the drought, in January 2007 the then Prime Minister, John Howard, leader of a conservative coalition, announced a \$10 billion package dependent on the states handing over control of water policy in the MDB to the Commonwealth government. Over the following 18 months the proposed institutional restructure was hotly contested by the various state governments. The eventual result was the Water Act 2007, enacted by the Howard Government with further amendments in early 2008 by the new Labor Government led by Prime Minister Kevin Rudd.

The new arrangements appear to involve a very substantial shift in power over policy to the Commonwealth government. The Murray–Darling Basin Commission was replaced by the Murray–Darling Basin Authority which, in addition to the responsibilities for water sharing between the states and a range of programs such as those dealing with water salinity previously exercised by the Commission, was also tasked to prepare a Basin Plan by 2011. Previously, the central MDB framework had dealt only with a limited range of issues agreed upon through a voting process requiring unanimity. The Basin Plan is to be comprehensive and deal with all issues that threaten environmental conditions and resource security, with a catchment-wide perspective ignoring state borders. It will be implemented by ten-year sub-plans that will be developed by each of the states in the MDB. They in turn will shape the various regional and sub-catchment plans within their areas of jurisdiction. Backing the Basin Plan will be substantial payments for compliance from the Commonwealth.

Nearly \$6 billion of the funding is to support the upgrading of water distribution and irrigation infrastructure in the MDB to equip the region to respond to the challenges predicted to result from climate change. The Commonwealth Government has stated that this funding should only be allocated after rigorous assessment focusing on how best to prepare for a very different climatic future. The existing arrangement of irrigation infrastructure (which consumes 95% of water extracted in the MDB) reflects expansion that occurred in the wet decades leading up to the 1990s. Understandably, irrigation-centred communities would all like to upgrade their local infrastructure to protect them at their current level of development, but predictions for the future suggest much drier and more variable conditions. This could mean different agricultural activities in fewer places than now. The battle between these competing visions of the future is becoming intense, with many communities seeing this as a fight for their very existence.

In addition, just over \$3 billion has been allocated to buy back water that will be used in key regions to halt the decline in environmental conditions. This too is strongly contested, even though water is only being bought from 'willing sellers'. Critics claim that this will cause communities to shrink because the amount of irrigation in their areas will be reduced. Similarly, a reduced number of irrigators will have to pay for the same level of delivery that previously supplied a larger volume of water to a larger number of irrigators. At a more fundamental level there is still wide-spread opposition – even if it is often not overtly expressed – to shifting water from irrigation to the environment. There is also concern about the impact on water prices of large-scale government purchasing programs.

Central to the new arrangements is the role of the Commonwealth minister designated with responsibility of approving the Basin Plan, the state sub-plans, and many related decisions (albeit subject to advice from the MDB Authority and the new MDB Ministerial Council). Also in the minister's department is the position of Commonwealth Environmental Water Holder which is responsible for the management of the water entitlements purchased for the environment. This is a statutory office subject to strict reporting requirements; however, many observers are concerned that the institutional constructs that are meant to protect its role as a manager focused on achieving environmental outcomes are weak and very dependent on ministerial goodwill.

What would happen if the key minister was part of a government that was aggressively pro-agricultural development, skeptical about predictions of climate change, and unsympathetic to sustainability and environmental perspectives? That was the situation for much of the time during which the Howard government was in office. Before the rapid shift in political position in that government's final months, there was very little support in practice for a greater emphasis on environmental sustainability. Most proposals for increasing the water available for the environment during the time of the Howard government focused on gaining water through increasing efficiency, thereby preserving the status quo for irrigation. In the same spirit, the original proposal put forward in January 2007 by then Prime Minister John Howard stated that the water purchased for the environment could be used as a drought reserve for irrigators if times were hard. (The argument that the environment is adapted to drought and therefore would not be significantly harmed is spurious; environmental adaptation to climate variability in the MDB evolved within a context where there was not the large additional impact of extractions for irrigation.)

Separate from that argument, there remains the continued danger that regional or state-based interest groups will still find it easy to undermine whole-of-basin perspectives. For a start, the new arrangements are based on referral of powers from the states, which can be revoked. But it is not only state governments that will fight for the interests of their state regardless of what a Basin-wide perspective might suggest. The Commonwealth parliament is made up of members from the relevant states. When the pressure is on they can be expected to lobby for state interests just as aggressively as their counterparts in state governments. Peter Cullen was quoted earlier to the effect that the MDB Initiative was undermined by the Commonwealth and MDB state governments because – each for their own reasons – they resented the loss of autonomy and capacity to make state-focused decisions

that came about from the need to coordinate through the MDB Ministerial Council and Commission. It can be argued that there is nothing in these new arrangements that would make them more resilient than the previous arrangements if similar tensions emerged once again – as could easily happen if the MDB Authority produced a draft Basin Plan that involved significant political costs to one of the state governments. In addition, the Water Act 2007/8 explicitly excludes any penalties, apart from the withholding of funds, from being imposed on non-compliant state governments. That means that the provisions for pressing the states to cooperate with a basin-wide perspective do not appear to be any stronger under the new arrangements than they were under the previous arrangements.

31.6 A final reflection

There is widespread agreement that the Murray–Darling Basin is in crisis – but what is the cause? This chapter has argued that one of the answers is the repeated failure to create a robust cross-border decision-making process at some remove from elected politicians (as intended with the initial plan to give that responsibility to the Interstate Commission when the Australian constitution was designed.) The political vacuum that this created allowed the development of four largely autonomous centres of power in the state capitals and resulted in the MDB becoming an open-access resource rather than a managed common resource.

The introduction of sophisticated adaptive management is one of the aims of the MD Basin Plan. Governments are now undertaking what is at least the fourth attempt to limit extractions and protect the key ecological assets of the MDB. The previous three were the 1989 Salinity and Drainage Strategy, the 1996 Cap on extractions, and the 2004 Living Murray project. But in each case there was never an officially sanctioned inquiry into why those earlier efforts eventually failed before they were replaced by the next wave of reform. In the case of disasters, such as bush fires and air crashes, an analysis of what went wrong is mandatory. By contrast, policy and institutional failures such as those which have occurred in the MDB are rarely examined, even though the consequences are often much more costly. The Commonwealth Water Act puts in place a process of periodic review for the Basin Plan. A review of institutional capacity that examines institutional design and policy effectiveness should also be included in that process.

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Challenges to water cooperation in the lower Jordan River Basin

ANNIKA KRAMER

32.1 Introduction

In the semi-arid to arid climatic conditions of the Middle East, water resources management is a contentious issue between parties sharing the same water resources.¹ At the same time, solving water problems has been identified as a common interest to Israelis, Jordanians and Palestinians. In response to this, in 1992 a Multilateral Working Group on Water Resources was established as part of a multilateral track aimed at enhancing the Middle East peace process. Since then, governmental and non-governmental institutions have started several bilateral and regional projects to promote water cooperation in the region. The implementation of water-related projects involving Palestinians, Israelis and Jordanians was seen as a hopeful sign for broader peace-building efforts and related projects have received substantial funding from the international donor community. And yet water projects face several barriers to cooperation, and today, almost 17 years after the peace process began, substantial cooperation in water resources management still remains limited.

This chapter aims to identify and analyse existing barriers to transboundary cooperation in water resources management in the lower Jordan Basin by analysing three initiatives that aim to promote water cooperation at different levels of society. The chapter first provides a brief introduction, and in Section 32.2 gives the main results of diverse research on the links between water and conflict. Section 32.3 gives an overview of the hydrological setting in the Jordan Basin and of water resources management by its riparians. This is followed by a presentation of selected initiatives that aim to promote water cooperation between Israelis, Palestinians and Jordanians. Section 32.5 analyses the challenges that these initiatives have to face, while Section 32.6 gives some recommendations on how they might be overcome. The analyses and recommendations are based on literature review as well as field visits to Jordan, the Palestinian territories and Israel, where interviews and discussions were held with coordinators and participants of the initiatives, government officials, and external experts.

Water Resources Planning and Management, eds. R. Quentin Grafton and Karen Hussey. Published by Cambridge University Press. © R. Quentin Grafton and Karen Hussey 2011.

I argue that existing asymmetries, inequalities and differences in expectations hamper the success of cooperative initiatives in water resources management. Moreover, the politicisation and centralisation of water resources management prevent local approaches from making their way to the national level. Any approach to foster transboundary cooperation in water resources management will have to proactively tackle existing asymmetries and inequalities if it is to be successful. On the other hand, to solve the existing severe water problems pragmatic approaches need to be taken as soon as possible – even if cooperation in water resources management has not developed fully and critical questions about water rights remain to be settled.

32.2 Water conflict and cooperation

Ismail Serageldin, former vice president of the World Bank, echoed a then commonly held belief when he warned in 1995 that 'the wars of the next century will be about water'. Several characteristics of water could support such a gloomy prediction. Water is a fundamental resource, indispensable to all forms of life on earth. Reliable freshwater resources are crucial to human and environmental health, as well as economic development. Almost every sector of human activity depends on water resources, from agriculture to industrial production and power generation. Furthermore, water resources are shared at the local, national and international levels, as the flow of water ignores state boundaries. Water management, therefore, requires actors to integrate and balance competing interests. Without a mutual solution, water users can find themselves in dispute and even violent conflict. Our language reflects these ancient roots: 'rivalry' comes from the Latin *rivalis*, or 'one using the same river as another'. Riparians – countries or provinces bordering the same river – are often rivals for the water they share.

Over the past few decades, a range of research has been carried out to study the various links between water (and the environment in general) and conflict, ranging from it being a structural cause of conflict to just a target of terrorist acts.² According to Wolf, there is a history of water-related violence on a sub-national level, but for nation states, the potential for violent conflict over water is actually relatively low (Wolf, 1999). A total of 1831 water-related events that occurred between states in the years 1948–1999 were investigated, yet two-thirds were cooperative and the vast majority of the remaining did not escalate to more than verbal arguments. Only 37 incidents reached an acute conflict level, 30 of which involved Israel and one or several of its neighbours (Wolf *et al.*, 2003).

As described above, there are many links between water and conflict, and conflicting interests seem to be inherent to water management. Still, water-related disputes must be considered within the broader political, ethnic, and religious context. Water is never the single – and hardly ever the major – cause of conflict (Wolf *et al.*, 2005). And even if the negotiation process is lengthy, most disputes are resolved peacefully and cooperatively. Several development initiatives provide lessons for tackling water-related conflicts and fostering cooperation (for an overview of approaches see Kramer, 2004). The fact that cooperative action overwhelms conflictive incidents and that cooperative water management institutions

prove resilient even in conflict environments, have further led researchers to focus on the potentials that water could hold for broader peace-building (Wolf *et al.*, 2005).

32.3 Water in the lower Jordan River

When trying to understand why so many conflicts over water have taken place between Israel and its neighbours, it is important to grasp the context in which use of joint water resources takes place. In the Middle East, especially, the limited water resources must be divided between neighbours who often do not share amicable relations. The following sections give a brief overview of the main water issues between Jordanians, Israelis, and Palestinians, which have been analysed in a rich body of literature.³ Whether, and to what extent, water issues have played and still play a role in the Arab–Israeli conflict has also been the focus of ample research.⁴ Libiszewski concludes that water issues have repeatedly been triggers of conflict, as well as a target of political and military action in the Jordan Basin region (Libiszewski, 1995). While most authors agree that water has played some role in the overall conflict, its relative weight within the mix of causal factors in the conflict continues to be disputed.

The Jordan River springs from three main streams: the Hasbani in Lebanon, the Baniyas in Syria, and the Dan in Israel (see Figure 32.1). These three streams join in the Huleh Valley in Israel from where they flow as the Jordan River southwards into Lake Tiberias. From there, the Jordan flows further southwards through the Jordan Valley, where it forms the border first between Israel and Jordan, and further downstream between the West Bank and Jordan. Finally, the Jordan empties into the Dead Sea. About 75% of the Jordan River Basin lies in either Israeli, Jordanian, or Palestinian territory (West Bank) (TFDD, 2002). Furthermore, the river's headwaters in Syria and Lebanon have largely been under occupation by Israel with the Golan Heights (since the 1967 Arab–Israeli war) and the occupation of southern Lebanon (from 1978 until 2000). While cooperative efforts in transboundary basins should ideally involve all riparians, up to date only a few initiatives have included Lebanon and Syria. This article will therefore focus on water cooperation in the lower Jordan River, i.e. between Jordanians, Israelis, and Palestinians.

Jordan, Israel, and the Palestinian territories are characterised by an arid climate, with evaporation exceeding rainfall for most of the year. The water resources available per capita are far below the limit that indicates chronic water scarcity.⁵ Some experts say, however, that the water scarcity is a human-induced effect caused by rising consumption, population growth, and limited resources, which are being further compromised by pollution (Messerschmid cited in Hass, 2008; Libiszewski, 1995). The single most important surface water source for the region is the Jordan River. Water development efforts on all sides of the river have today reduced the flow of the Jordan to only 10% of its natural discharge below Lake Tiberias. What little remains is of the poorest quality (FoEME, 2005). Aquifers provide over 50% of the freshwater supply for Israel and Jordan (Libiszewski, 1995). Aquifers also provide almost the total consumption in the Palestinian territories (Zeitoun, 2008). Aquifers on all sides are threatened by overpumping and pollution, mainly through untreated wastewater and agricultural leakage.

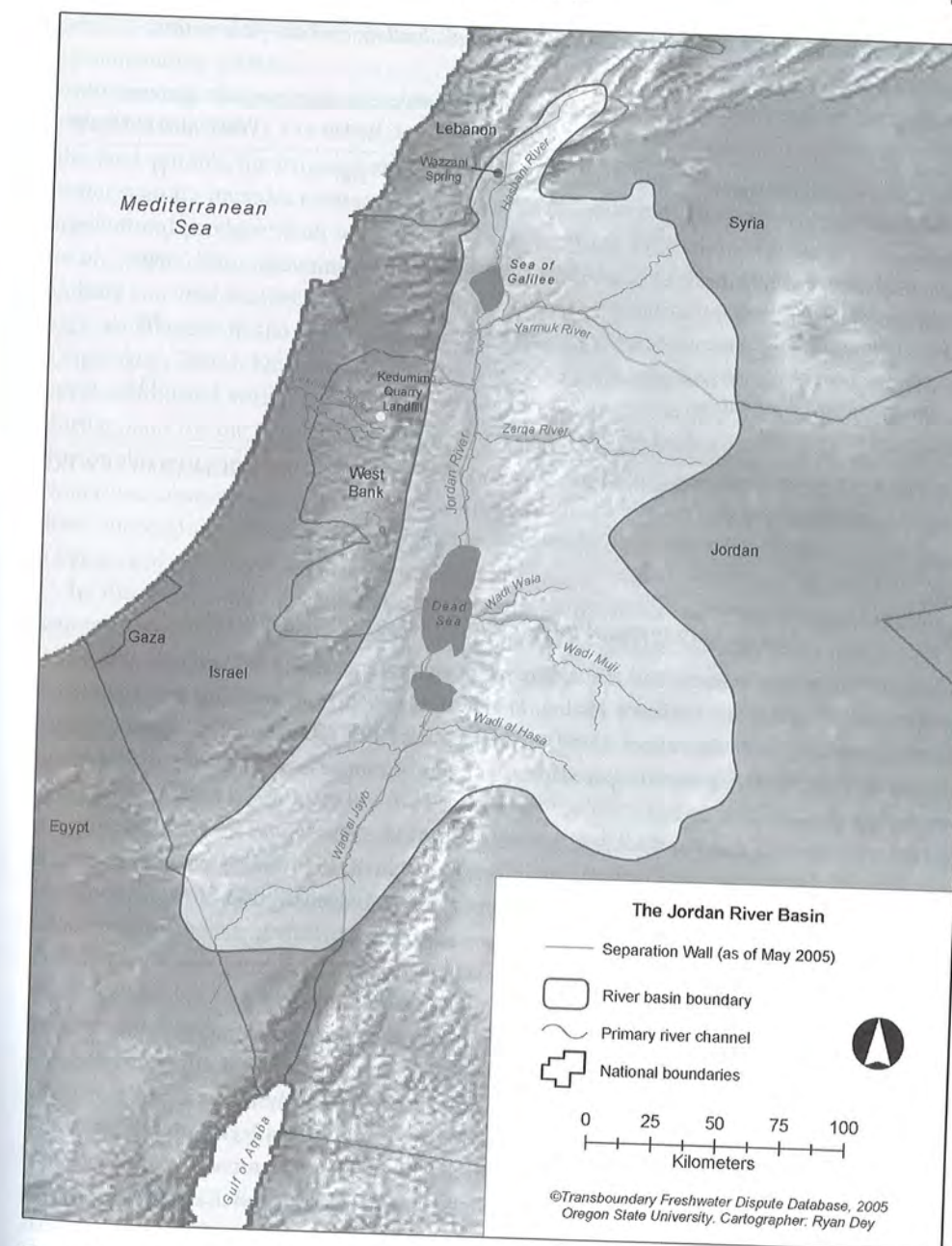


Figure 32.1. Map of the Jordan River Basin (Source: Transboundary Freshwater Dispute Database, Department of Geosciences, Oregon State University. Additional information about the TFDD can be found at <http://www.transboundarywaters.orst.edu>.)

Table 32.1. Overview of the water situation in Israel, Jordan, and the Palestinian territories

	Israel	Jordan	Palestinian territories
Total actual renewable water resources ^a (m ³ per capita per year)	250	160	41
Domestic water consumption (litres per capita per year)	240–280 ^b	94 ^c	60 ^b
Access to improved drinking water (percent of population)	100 ^c	91 ^d	75 ^d
Access to improved sanitation (percent of population)	100 ^f	85 ^c	35 ^d

Sources: ^a UNESCO (2006); ^b Fröhlich (2008); ^c Courcier *et al.* (2005); ^d World Bank (2007); ^e WHO Data (2006); ^f Globalis (2002).

32.3.1 Management and development of water resources

Water resource development and management, as well as access to freshwater, is characterised by great asymmetry between Jordan, Israel, and the Palestinian territories. Table 32.1 gives an overview of the water situation in terms of the total actual renewable water resources (TARWR),⁶ domestic per capita water consumption, and access to improved drinking water and sanitation.⁷

It must be noted that the TARWR figures give the de facto water availability for each party, thus reflecting not only natural conditions, but also the distribution patterns of shared resources. These numbers therefore also reflect the unequal distribution of transboundary water resources, especially among Palestinians and Israelis, with Israel consuming about 85% of the shared resources.⁸ The following sections give a very brief overview of water management in Israel, Jordan, and the Palestinian territories.

Israel's export-oriented agricultural sector accounts for approximately 50% of total water use in Israel (Feitelson *et al.*, 2007). Israeli farmers use the most effective irrigation techniques (Jägerskog, 2003), and thus manage to irrigate nearly all of Israel's irrigable land (Libiszewski, 1995). The water sector is highly developed with regard to water reuse and desalination. In Israel's centralised and supply side-oriented water management system (Zeitoun, 2008) national water allocation tends to favour agricultural use (Feitelson *et al.*, 2007), even though agriculture only contributes a small percentage to the Gross National Product and employment rate (Jägerskog, 2003). Agriculture has played an important role in the Zionist ideal to 'make the desert bloom', and the agricultural sector is still often exempted from justified criticism (Beschoner, 1992; Fröhlich, 2008; Zeitoun, 2008). The ideological approach to water resource management has resulted in institutional structures that empower the agricultural sector while minimising opportunities for other stakeholders,

such as civil society and minorities to participate in decision-making on water allocation (Fischhendler, 2008a).

In **Jordan**, the agricultural sector consumes about 75% of the total water available (World Bank, 2007). Owing to the limited water resources available, only about 10% of the land suitable for irrigated cultivation is currently being irrigated (FAO, 2009). While water scarcity impedes economic development in Jordan, water is virtually exported with agricultural produce: fruit and vegetables account for 12% of Jordanian exports (Venot *et al.*, 2006). Still, agriculture contributes relatively little to the GDP. Nevertheless, agriculture is a vital socioeconomic activity that plays an important role in the national ideology, so changes in the water allocation to the agricultural sector find strong opposition (Jägerskog, 2003). Decision-making on allocation of water resources is for the national level centralised within the Ministry of Water and Irrigation and the Water Authority of Jordan, and for the river valley within the Jordan Valley Authority. Formal mechanisms for public participation in water allocation only exist in pilot projects that established water user associations (Regner *et al.*, 2006). Still, some Bedouin tribes and landowners have successfully lobbied against policies that would have constrained their use of water (Venot *et al.*, 2006).

In the **Palestinian territories**, the average daily domestic water consumption per capita is around 60 l (Fröhlich, 2008), but this varies significantly between places and in some villages is far below this average. The limited access to improved sanitation poses health risks and further reduces the available water resources, as aquifers are polluted by wastewater (World Bank, 2007). Agriculture uses about half of the total water withdrawals, while domestic usage accounts for most of the remainder (World Bank, 2007). In 2003, only about one-fifth of the irrigable land in the West Bank could be irrigated due to Israel's restrictions (FAO, 2009). Still, the agricultural sector plays a considerable role in the employment and livelihoods of the Palestinians (Jägerskog, 2003). Since the occupation in 1967, Palestinians have depended on Israel's permission and donations for development of their water resources and wastewater treatment. Against this background, the Palestinian Water Authority (PWA) has little room for manoeuvring in water management. While donors have given considerable funding, few water development projects have been granted permission to be implemented. Additionally, political nepotism and corruption have been identified as hindering a prospective development process for the water sector (Klawitter and Barghouti, 2006). While some of the wells under Palestinian control are in effect still managed by traditional structures, public participation in water management is very limited. For instance, the public was completely excluded from the development of the 2002 Water Law (Zeitoun, 2008: 74).

32.3.2 History of Israeli–Palestinian and Israeli–Jordanian water relations

The political importance of water issues between Arabs and Israelis dates back to the 1920s and is rooted in the Zionist movement's development plans, which heavily depended on water for large-scale irrigation and hydropower (Wolf, 1996). Relations have been strained

since the late 1940s, when the parties first began working separately on water development plans (Wolf, 1996; Libiszewski, 1995).

The situation between the riparians became so tense that the USA decided to mediate, which led to the Johnston Plan in 1955, an agreement that laid down water quantity allocations to Israel, Jordan, Lebanon and Syria. However, this plan was never ratified because of overwhelming political conflicts, and the nations continued to pursue their own agendas to develop the rivers to serve their own increasing demands (Libiszewski, 1995). When these developments began to overlap, disputes arose again and culminated in the Israeli army attacking water diversion works in Syria in 1965. These events set off what has been described as 'a prolonged chain reaction of border violence that linked directly to the events that led to the (June 1967) war' (Cooley, 1984, cited by Wolf, 1996).

After the 1967 war, water disputes between Israel and Jordan remained focused on diverting water from the Jordan Basin. Between the Israelis and Palestinians, however, water issues have turned markedly different as Israel gained control over all Palestinian water resources in the 1967 occupation. Under military orders, a permit system was established for drilling new wells and pumping quotas were assigned to restrict water use. Israel permitted the drilling of only 23 new wells between 1967 and 1990, mainly to replace older ones (Jägerskog, 2003). In addition, Israel drilled new wells for Israeli settlements and consequently uses the lion's share of the groundwater recharged in the West Bank (Dombrowski, 2003). Since 1967, Palestinians have further been denied access to the Jordan River and its water resources.

When peace talks with regional and outside parties opened in 1991 within the Middle East peace process, water-related issues were heavily disputed in the bilateral negotiations and eventually included in respective bilateral agreements (see below).⁹ Furthermore, water was one of the five issues to be discussed in the multilateral talks.¹⁰ The intention of the multilateral talks was for them to work as a catalyst and to facilitate progress in the bilateral talks that Israel would conduct with each Arab delegation. The technical discussions and activities that took place within the framework of the Multilateral Working Group on Water Resources (MWGWR)¹¹ between 1992 and 1996 have been considered important as a means for confidence-building (Jägerskog, 2003) that supported the peace process (Peters, 1999).

32.3.2.1 Israeli–Palestinian water relations

The agreements that resulted from the bilateral talks between Israel and the Palestine Liberation Organization (PLO)¹² cover a range of water issues, including studies and plans for joint development of water resources, and the establishment of a PWA. The power of the PWA, however, was (and still is) limited by the fact that Israel maintained control over a number of wells in the West Bank to supply settlements and military camps. In addition, all regulations that the PWA proclaims have to go through a Joint Water Committee that was established with the agreement for coordination of water and sewage management (see below). In the 1995 Interim Agreement on the West Bank and the Gaza Strip, Israel acknowledged Palestinian water rights for the first time, but actual negotiation of these

rights was considered too contentious, and was therefore postponed to the permanent status negotiations. For the interim period, the agreement basically maintained water allocations for Israel (Jägerskog, 2003) while a quantity of 70–80 million m³ should be made available to the Palestinians.

To date, water relations are characterised by the Palestinian claim for independent control and rights to water resources, which they see in the context of nation statehood (Jägerskog, 2003). The Israeli position, on the other hand, focuses on control over water as a national security issue, with Israel fearing that the Palestinians could use water as a strategic weapon were they to gain control over transboundary water resources (Weinthal and Marei, 2002). However, it is important to acknowledge that water has been secondary to other politically more salient issues in the negotiations between Israelis and Palestinians, such as the issue of Jerusalem or borders (Jägerskog, 2003).

32.3.2.2 Israeli–Jordanian water relations

The **Israeli–Jordanian Peace Treaty** that was signed in October 1994 includes extensive water provisions, such as allocation of rights to water resources in the Jordan Basin, as well as joint projects to develop further water resources and prevent pollution (Wolf, 1996). The treaty also states that 'the subject of water can form the basis for the advancement of cooperation between them [the parties]'.¹³ An Israeli–Jordanian Joint Water Committee (see below) was established to implement the agreement.

Implementation of the Peace Treaty's water provisions has however not been unproblematic. Munther Haddadin criticises that several of the water provisions from Israel to Jordan have not yet been implemented as stipulated within the agreement (Haddadin, 2006). Problems continue to arise, mainly due to ambiguities in the treaty text (Fischhendler, 2008b). The Peace Agreement, for example, stipulated the supply of an additional 50 million m³ of water to Jordan. However, the two parties could not agree on the source and financing for the water provision. In 1999, and due to drought, Israel decided to reduce the quantity of water piped to Jordan by 60 percent, which led to a sharp response from Jordan. Disputes of this kind are not unexpected in the future (FAO, 2009).

The most recent, directly water-related conflict occurred in 1969 when Israel attacked Jordan's East Ghor Canal following suspicions that Jordan was diverting excess amounts of water (Green Cross Italy, 2006). In general, however, Anders Jägerskog concludes that 'the surrounding political environment effectively sets the boundaries for what has been feasible in the water sector', and not the other way around (Jägerskog, 2003).

32.4 Existing initiatives to promote water cooperation

Numerous initiatives have worked towards promoting regional water cooperation among Palestinians, Israelis, and Jordanians (for an overview of selected initiatives see Kramer, 2008) or between two of the Jordan River riparians. This section will look at three different approaches taken by actors to promote water cooperation in the lower Jordan Basin: (a) the Joint Water Committees that have been established after the peace process in the 1990s

between Israel and Jordan, and Israel and the Palestinian Water Authority, respectively; (b) the Regional Water Data Banks Project (RWDBP) working in collaboration with national water agencies; and (c) the Good Water Neighbours initiative by Friends of the Earth Middle East (FoEME) that works with local communities.

The three initiatives reflect different approaches to promoting water cooperation: (a) institutionalised official communication between government representatives; (b) exchange of expert knowledge and data; and (c) local-level collaboration. The analysis of efforts targeting different levels of society will allow us to draw overall lessons and to illustrate structural barriers to cooperation. In the following, the three initiatives will be briefly presented and examples of their main challenges with regards to water cooperation pointed out.

32.4.1 The Joint Water Committees

Agreements to settle water-related disputes have shown to be more effective if strong and competent river-specific institutions are established to implement them (compare Hensel *et al.*, 2006). On the international level, river basin commissions have been successfully involved in joint riparian water resources management, provided that they ensure equal representation and participation of all riparian states – examples include the International Commission for the Protection of the Rhine and the Orange–Senqu River Basin Commission (ORASECOM) in southern Africa, among others. In the lower Jordan River basin, Joint Water Committees (JWCs) have been established to oversee implementation of water-related issues stipulated in bilateral agreements between Israel and the PWA, and Israel and Jordan, respectively.

32.4.1.1 The Israeli–Palestinian Joint Water Committee

The 1995 Interim Agreement on the West Bank and the Gaza Strip between Israel and the PLO foresees coordination in water and sewage management, implemented through a permanent Israeli–Palestinian Joint Water Committee (IP-JWC). The IP-JWC is made up of an equal number of members from each party, which are allowed to invite further experts. Decisions are made by consensus and issues of high importance are passed to the political level. The IP-JWC has continued to meet throughout times of violent conflict and the second Intifada.

While the IP-JWC has, therefore, been stated by some as a good example of transboundary water cooperation, the IP-JWC is not conflict free (Zeitoun, 2008). It is characterised by power asymmetry that Selby has coined ‘domination dressed-up as cooperation’ (Selby, 2003). Notably, the jurisdiction of the IP-JWC only covers the water resources located within the political borders of the West Bank, not those within Israel. Furthermore, decisions about all permits requested for areas outside the urban centres (Areas C, comprising 72% of the West Bank), are ultimately taken by the Civil Administration of the Israeli Defence Forces, thus giving the Israeli side a de facto veto power (Zeitoun, 2008).

The Palestinian side further complains that their projects are being rejected noticeably often, whereas the Israelis argue that they have technical or scientific reasons for

rejection. Zeitoun considers the IP-JWC ineffective as it did not prevent over-development of the resource on the Israeli side, nor under-development on the Palestinian side (Zeitoun, 2008: 157); similar opinions were expressed by an Israeli researcher (personal communication).

32.4.1.2 The Israeli–Jordanian Joint Water Committee

The 1994 Israeli–Jordanian Peace Treaty includes extensive water provisions (see above), the enactment of which should be ensured by an Israeli–Jordanian Joint Water Committee (IJ-JWC). The IJ-JWC is made up of three members from each party, which can invite experts and advisors and create sub-committees for technical purposes (Jägerskog, 2003: 144). The IJ-JWC was also set up as the forum to address disagreements, including the interpretation of treaty ambiguities (Fischhendler, 2008b).

The working relations within the JWC, on a professional level, can be seen as functioning rather well (Jägerskog, 2003). Still, when looking at the JWC’s success in addressing critical water issues, such as the existing ambiguities in the Peace Treaty’s water provisions, progress has been limited. Open questions remain: e.g. around who should pay for additional water to be provided to Jordan and how water allocations would be affected in times of drought. This has caused disputes that required mediation by the US ambassador or intervention by the Israeli Foreign Affairs Minister, who was concerned for both countries’ international relations (Fischhendler, 2008b).

32.4.2 The Regional Water Data Banks Project

The Regional Water Data Banks Project (RWDBP) consists of a series of specific actions taken jointly by the core parties – the Jordanian, Israeli and Palestinian water agencies. It is one of the projects that came out of the Multilateral Working Group on Water Resources (MWGWR, see section on ‘Water in the Jordan Basin’ above) of the Middle East Peace Process and began working in 1995. The RWDBP was designed to respond to the need for enhanced water data availability and its aims were more specifically to:

- foster the adoption of common, standardised data collection and storage techniques among the parties;
- improve the quality of the water resources data collected in the region; and
- improve communication among the scientific communities in the region.

The RWDBP involves a number of sub-projects. The final outcomes include a range of internal reports that assess current data availability and data collection practice within each core party, as well as public reports summarising information on water resources in Jordan, Israel and the Palestinian territories. Furthermore, the projects under the RWDBP included considerable training activities for the staff of the respective water agencies. In addition, the core parties were provided with equipment and were trained how to use it. In the past few years, activities have shifted from databases towards more technical projects, such as development of decision support systems and implementing pilot plants.

Implementing joint projects can be a first step in establishing cooperation in water resources management (Wolf *et al.*, 2005). By moving riparians' focus from conflicting interests towards benefits of cooperation, they can help prevent the escalation of disputes. Collaboration in data collection and monitoring of water quality and quantity is a common field for joint projects among riparians. A hydrological database acceptable to all riparians is essential for any joint water resources management efforts, as it enables water-sharing parties to make decisions based on the same understanding of the existing hydrological situation. Furthermore, disparities in the parties' capacity to generate, interpret, and legitimise data can lead to mistrust towards those with better information and support systems. Joint monitoring and data collection can thus, in turn, help build trust (Wolf *et al.*, 2005). Still, information sharing is just a first cooperative step, as it might still be a long way towards joint management of water resources (Sadoff and Grey, 2005).

With regards to the RWDBP, different expectations towards the data banks have been expressed in interviews from the different sides. Some interviewees said that the idea had always been to develop separate data banks, with the potential to join at a later stage when the political situation would allow it. Other participants, however, expected a joint data bank and expressed their disappointment that the data had not been shared. Furthermore, Palestinians expressed that they could not equally benefit from the project activities, because they did not have their own data and were restricted from taking samples on their own territories.¹⁴ Against this background, exchanging data could act as a powerful tool for building trust and improving water management. In order for this to happen, however, there must be the political will to share the relevant data and information. If political will is absent, additional mistrust can accumulate, as was the case for some of the RWDBP participants.

Capacity development and technology transfer can play a major role in overcoming asymmetries. Such initiatives, however, can only be effective if the acquired knowledge can actually be applied. The PWA has limited monitoring and managing power. Therefore, much of the capacity that has been developed is lost over time (Kramer, 2008).

32.4.3 The Good Water Neighbors project

The 'Good Water Neighbors' (GWN) project was established by EcoPeace / Friends of the Earth Middle East (FoEME) in 2001 to raise awareness of the shared water problems of Palestinians, Jordanians, and Israelis. Its two primary goals are (FoEME, 2005):

- to advance cross-border cooperation by focusing attention on shared water concerns and the need to protect shared water resources; and
- to foster peace and cooperation through long-term trust-building based on the shared interests of neighbouring communities.

Today, 17 communities participate in the GWN project. Each community is partnered with a neighbouring community on the other side of the border/political divide with which it shares a common water source. GWN works at the local level with community members

through education and awareness activities and by implementing ecological projects. Program participants include youth, adults, environmental professionals, and municipal leaders. A major focus in most communities is working with the youth. Main youth activities include education on water issues in their own and neighbouring communities through lectures and field trips. Student groups called 'Water Trustees' are set up where members get involved in awareness campaigns and ecological projects such as the building of ecological gardens and rainwater harvesting systems. Adults were involved, for example, in a series of workshops, focusing on environmental problems and discussing potential solutions for priority problems. Moreover, residents and representatives of the municipalities and local tourism businesses have been involved in preparing 'Neighbors Paths', trails that raise public awareness about water concerns shared with partnering communities.

Through dialogue and cooperative ventures across borders, GWN works to encourage sustainable water management at the regional level. These include summer youth camps and regional conferences. GWN further tries to ensure the mayors' support for the project and regional cooperation on water/environmental issues. Cross-border and regional meetings of the mayors of participating communities have been organised that culminated, among others, in the signing of several Memorandums of Understanding between mayors of neighbouring communities.

International disputes over the allocation of shared water resources can at least partly be explained with the reluctance of riparian states to confront domestic water sector reform (Luzi, 2006). Raising awareness on the local level about shared water problems can, therefore, be an important step in support of national level approaches to water cooperation. Further, utilising the communities' mutual dependence on shared water resources can serve as a basis for developing local level dialogue and cooperation and thus promote sustainable water management.

The GWN project aims to build on existing shared water sources and identify common problems in order to move from mere dialogue to joint action. It is important to identify a topic of authentic interest for all participants, as experience has shown that it can be extremely hard to mobilise people for a long-term collaborative effort when they are concerned about basic needs (Paffenholz and Spurr, 2006). When asked for their needs related to environmental peace-building efforts, participants and staff of the GWN in Israel, Jordan and the Palestinian territories indicated very different priorities, which in essence included the following (Kramer, 2008): Jordanians focused on economic development and free movement of people and goods; Israelis concentrated on reconciliation and improved environmental management; and Palestinians stressed the importance of access to water and land rights, as well as the ending of occupation. Considering the diverse needs, identifying a topic that will equally benefit all, or even two neighbouring communities, posed a major challenge.

The work of GWN is also curbed by the fact that local initiatives have only limited means, in centralised systems, to impact water resources management. This has led to frustrations coming from the lack of improvement of the water situation. Some Jordanian representatives expressed their frustration about the fact that they could not see any improvement in

the Jordan's water quality, and therefore questioned whether their Israeli counterparts were effectively working towards the same goal (Kramer, 2008).

32.5 Challenges to water cooperation

The initiatives this article focuses on take very different approaches to promoting regional water cooperation. Nevertheless, commonalities exist in the challenges they have to face. On the one hand, water management in this region is characterised by some aspects that complicate regional cooperation. In addition, the working conditions in an ongoing conflict climate complicate cooperation activities. The common challenges of the initiatives with regard to promoting water cooperation include the following.

Asymmetries Asymmetrical power relations among the three parties determine water relationships at the political level, e.g. in the JWCs. Different levels of capacity in human and financial resources pose challenges to cooperative efforts, as they can make it difficult to choose suitable technologies, for example databases and decision support systems in the RWDBP. This can cause frustrations among the weaker as well as the stronger party. Further, water inequalities resulting in diverging interests make it difficult to identify projects that can be equally beneficial for all three parties. At the level of project implementation, the asymmetries are evident in the logistics, such as different obstacles for travelling to joint meetings.

Water is a political issue The above-mentioned water inequalities are connected to the fact that water has become a very political issue. The fact that the Palestinians do not hold power over water resources in their territory makes cooperation in an equal partnership near impossible. Any project working on water is difficult to separate from questions of water rights and justice. The importance of water for the ideology of Zionism and Arab nationalism further leads to securitisation and politicisation on all sides. This puts a limit to initiatives that aim to promote cooperation at the technical level, as the decision to share data, for example, is taken at the political level.

Promoting spill-over The GWN and RWDB projects show that water is an issue that communities and experts agree cannot be solved unilaterally. Still, spill-over of cooperative behaviour on the local and technical levels towards higher political spheres is difficult to achieve in centralised water management systems. For the RWDBP, spill-over was originally intended to take place from the (more technical) multilateral to the political bilateral track of the peace process. Whereas these tracks stalled, spill-over effects could be expected from the RWDBP towards the JWCs as both involve the water authorities. However, there seems to be little impact on cooperative water management, as the Israeli–Palestinian JWC, for example, does not function satisfactorily (Zeitoun, 2008; Selby, 2005), and the Israeli–Jordanian committee continues to struggle with the ambiguities of the Peace Treaty.

Different expectations The asymmetries described above, as well as the parties' different priorities and needs, create diverging expectations and perceptions with regard to cooperation. Managing high and often different expectations poses a major challenge. The goals and possibilities of initiatives need to be transparent and clear in order to prevent

frustrations on all sides. Otherwise, mounting frustrations can lead to failure of cooperative efforts.

32.6 Conclusion and recommendations

While the initiatives show that dialogue on water is possible among Palestinians, Jordanians and Israelis, they further indicate that joint water initiatives soon hit a road block when it comes to cooperation on issues that tackle actual water resources management. This is especially true for freshwater issues, whereas wastewater, in the current situation, provides slightly better opportunities for cooperation, since it does not directly affect the critical question of water rights. Other environmental issues seem to provide more potential for initiating cooperation processes in this region, provided that their aim is not only conservation, but also economic and health benefits. Linking water with other such issues represents a promising approach to providing mutual benefits and thus an incentive for cooperation.

Still, cooperation in water resources management remains an important goal, as it is the only way to sustainably manage the scarce water resources in the region. Cooperation is important in order to provide water for health security and livelihood reasons, and because water disputes fuel existing conflicts. Initiatives that aim at fostering cooperation for the sake of more sustainable water management will have to take a conflict-sensitive approach and ensure that they do no harm in the existing conflict context. Developing capacities of the weaker parties should be a major focus. Given the existing asymmetries and that water issues are highly politicised, initiatives should first consider working individually with each party, in order to prepare them for cooperation at a later stage. Such initiatives will only be effective, though, if they are complemented by efforts aimed at empowering all parties and advocating for water rights.

In some cases, existing scarcity and increasing water pollution indicate that the parties need to act now – even if cooperation in water resources management has not fully developed and critical questions about water rights remain to be settled. In order to immediately solve existing problems, practical joint water management solutions should be found to protect human and environmental health, despite the larger political concerns. Concern that such solutions could affect future negotiations on water allocations and land rights could, for instance, be met by laying down formal agreements that stipulate that these will remain unaffected.

Against this background, funding agencies and third parties involved in regional water cooperation initiatives should do the following.

Address existing asymmetries Any initiative that aims to promote the links between regional water cooperation and peace-building in the Middle East must take account of existing asymmetries with regard to human and financial capacities, as well as political power. These asymmetries need to be addressed in the design and implementation of initiatives in order to ensure that cooperation provides at least mutual – if not equal benefits – and to prevent asymmetric power relations favouring one party. It is of the utmost importance that the stronger party does not dominate the cooperative process and that project goals

respond to the needs of weaker parties as well. Capacity-building to overcome asymmetries must be complemented or coordinated with initiatives advocating empowerment of the parties.

Promote regional water cooperation towards peace-building and human security The lack of political cooperation can impede technical solutions to existing water problems and can limit the effectiveness of water cooperation with regard to sustainable water management. A lack of political will for cooperation can also limit the impact of technical and civil initiatives. Donors should therefore take an active role in promoting regional water cooperation with the national governments and authorities – considering the mutual benefits it offers for economic development, human security, and peace in the region.

Advocate the empowerment and involvement of water user and stakeholder groups in the process of developing water policies and cooperative political frameworks. This could help in transferring the successes of local and technical water cooperation initiatives to the political level. Working towards improving international relations should thus go hand in hand with improving national and local water management institutions and practices, e.g. by promoting institutional frameworks that allow for systematic involvement of stakeholder groups.

Provide ongoing funding, even when conflict escalates The examples of water cooperation show that collaboration and communication channels can be maintained even when the political peace process collapses, as with the outbreak of the second Intifada. While this alone does not constitute an objective, it shows the importance of maintaining funding, even in times when conflict escalates. This will allow initiatives to continue the important work of cooperation in water resources management.

Not interpret the need to remain impartial between the parties as a need to stay silent on abuses and injustices parties commit. If opportunities to express concerns about inequalities and human suffering are not offered in cooperative processes, technical discussions on environmental cooperation can easily become infected by political issues.

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Endnotes

1. This Article is based on research carried out within the Initiative for Peacebuilding funded by the European Commission. For further information see www.initiativeforpeacebuilding.eu.
2. See, for example, Gleick (1993); Homer-Dixon (1994); Baechler (1998); Wolf (1998); Diehl and Gleditsch (2001).
3. See, for example, Naff and Matson (1984); Wolf (1995a); Libiszewski (1995); Allan (2001); Selby (2003); Zeitoun (2008).
4. Jägerskog (2003) provides an extended list of literature that has dealt with the question.
5. The Falkenmark water stress index measures per capita water availability and considers that a per capita water availability of between 1000 m³ and 1600 m³ indicates water stress, 500–1000 m³ indicates chronic water scarcity, while a per capita water availability below 500 m³ indicates a country or region beyond the 'water barrier' of manageable capability (Falkenmark and Widstrand, 1992).
6. TARWR is an index that reflects the water resources theoretically available for development from all sources within a country. It must be noted that the figures give the de facto water availability for each party, thus reflecting not only natural conditions but also the distribution patterns of shared resources.

7. Access to improved water refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well, spring, or rainwater collection. Access to improved sanitation facilities refers to the percentage of the population with access to at least excreta disposal facilities that can effectively prevent human, animal and insect contact with excreta (World Bank, 2007).
8. Zeitoun (2008) gives a full overview of actual Israeli control over water resources in the West Bank.
9. For an in depth description of negotiation positions taken by the parties see e.g. Dombrowsky (2003) and Jägerskog (2003).
10. The multilateral talks covered five different issue areas defined on the basis that they crossed national boundaries and that their resolution is essential for long-term regional development and security: management of regional water resources; the refugees question; environmental problems; regional economic development; and arms control (Peters, 1999; RWDBP, 2002).
11. For an account of the first six sessions of the MWGWR, see Wolf (1995b).
12. The 1993 Declaration of Principles on Interim Self-Government Arrangements, the 1994 Gaza–Jericho Agreement, and the 1995 Interim Agreement on the West Bank and the Gaza Strip.
13. The Israeli–Jordanian Peace Treaty. Available at http://www.kinghussein.gov.jo/peace_6-15.html, accessed 11 April 2010.
14. Personal interviews held with PWA staff (Ramallah, July 2008).

Adaptation and change in Yellow River management

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33.1 Introduction

Perhaps the single most significant development shaping global economic and political patterns during the last quarter-century has been the 'rise of China'. Since 1980 China has engaged in a profound economic restructuring that has generated one of the largest (at least measured by the numbers of people affected) and quickest social transformations in global history. At the centre of the transformation to a market economy has been changes in China's management of resources. Along with energy, water will continue to be the key to continued economic growth in China. The North China Plain perhaps best exemplifies this water challenge. And the major predicament of this area is effectively managing the Yellow River that runs through the very centre of this critical agricultural and industrial region – a region that is also well below the global average of water availability per capita.

In 1997, the Yellow River dried up, some 750 km away from its mouth in the Bohai Sea. Domestically, the dry-up signalled that Yellow River management had reached crisis stage. Internationally, the general issue of water scarcity in North China prompted speculation about China's future ability to feed itself and the potential impacts on global food security (Brown and Halweil, 1998). Unprecedented pressures of urbanisation, industrialisation, and expanding agriculture suggested to political and technical elites that China's water management had reached a critical point; from here, engineering and managerial innovation and borrowing would be necessary to cope with increasingly scarce water resources. What distinguishes these changes in management patterns in China from other places, however, is that they are embedded in a long history of state responses to water management issues.

The goal of this chapter is to provide an examination of China's current challenges of managing water generally, and with managing the Yellow River in particular. The chapter also suggests approaches to Yellow River management that may complement state social and economic goals. To help observers of Chinese water management appreciate the cultural and historical context of contemporary management patterns, this chapter also out-