Chapter Three

'Over allocation' - the major problem

The Murray Darling Basin

3.1 The major problem brought to the attention of the committee in submissions and oral evidence during its inquiry is the vexed issue of over allocation of river water in the whole Murray-Darling Basin, an area which receives 6.1 per cent of Australia's distribution of run-off but where nearly 75% per cent of the country's irrigated agriculture occurs.[1]

3.2 More than 66 per cent of the water that would normally reach the sea from all rivers in the basin is now diverted for use. There has been a large increase in diversions since the 1950s and more particularly in the 14 years to 1996 which saw almost a 60 per cent increase in the use of surface water for irrigation in the basin. Regulation has eliminated the most extreme of the low flows (and is credited with keeping the Murray flowing during the 1982-1983 drought), but the level of diversions is having a huge negative impact on the health of the river.

3.3 The Murray-Darling Basin Commission's website tells the story of over regulation and over allocation starkly:

- Mean outflow from the Murray to the sea reduced from some 12,300 gigalitres (GL) per year under natural conditions to 4,900 GL per year (40 per cent of natural flows)
- Median annual flow to the sea (i.e. the flow that is exceeded in 50 per cent of years), is now only 27 per cent of the natural median flow.
- From around 3,000 GL in 1930, diversions now total over 11,000 GL (Thomson 1994, 8).[2]
- Rivers in the basin are now in a state of drought (as defined by river levels) for more than 61 years in every 100 compared with 5 years per hundred under natural conditions (MDB Ministerial Council 1995, 19). [3]

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1 Dr Colin Chartres, A Strategic Science Framework for the National Water Commission, p. 6-7.

2 Note: The average annual surface use of water from the MDB in the years to 2004-2005 was estimated to be 11,518 GL, MCDC Factsheet, July 2006.

3 MDBC, The Impacts of Water Regulation and Storage on the Basin's Rivers, www.mdbc.gov.au/nrm/water_issues/impact_of_water_regulation_and_storage

- Flows that were only naturally experienced in the driest 10 per cent of years are now expected in 27 per cent of years (MDBMC 1995, 25).

3.4 Recently updated figures on the effect of the current drought on the state of the Murray-Darling Basin, can be found at: http://www.mdbc.gov.au/rmw

3.5 In 1995, the MDB Commission's audit of water use in the basin revealed that water diversions from the rivers in the basin had increased by 8 per cent in the previous six years and were averaging 10800GL per year.[4] However, by the end of 1996, NSW, Victoria and South Australia had agreed to cap diversions from the river.

3.6 The states and territory dependent on water in the Murray-Darling Basin are now committed through the National Water Initiative to work towards sustainable management of the rivers in the basin and their catchments. But, referring to the states, CSIRO's Shahbaz Khan told the Triennial Maize Conference at Griffith, NSW in February 2006:

> All their water resources Acts are based on political rather than catchment/hydrological boundaries. Catchment management boundaries are required for ecologically sustainable management at the national level.[5]

3.7 To complicate matters further, water licences in the MDB have been issued on the expectation of water flows based on average rainfall for the last century. Climatologists are now throwing those averages into doubt since they believe that the 50 years from 1950 to 2000 may have been unusually wet for the Australian continent and that we may now be reverting to a normal rainfall pattern. Prof. Shahbaz Khan argues that both the "cap" and the Living Murray Initiative may be based on those over-optimistic "wet" rainfall and river flow figures.[6]

Capping river extractions

3.8 The "cap" as agreed by the Murray Darling Basin Ministerial Council in 1996 was defined as follows:

- For NSW and Victoria, the Cap is the volume of water that would have been diverted under the 1993/94 levels of development plus allowances in the Border rivers for Pindari dam (NSW) and in the Goulburn/Broken/Loddon system for lake Makoan (Victoria)

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4 MDBC, Water Audit Monitoring Report 2004-2005, Report of the Murray Darling Basin Commission on the Cap on Diversions, June 2006, p.14 http://www.mdbc.gov.au/nrm/the_cap/wam_reports

5 Prof. Shahbaz Khan, *Managing Climate Risks in the Driest Continent: Options for Water Policy and Irrigation Management*, p.7-8, Paper presented at the Triennial Maize Conference at Griffith, NSW in February 2006; tabled document, 7 March 2006.

6 Prof. Shahbaz Khan, tabled document - as above.

- For South Australia, *All Other Purposes* diversions were capped at 440.6 GL. This represents an increase in diversion over 1993/94 levels of development but they are below allocations that were established in 1969.

3.9 The cap for Queensland was to be determined at a later stage. The Murray Darling Basin Commission points out in its Water Audit Monitoring Report 2004-2005 that the cap in NSW and Victoria is not the volume of water that was used in 1993/94. Rather, the cap in any year is the water that would have been used with the infrastructure (pumps, dams, channels, areas developed for irrigation, management rules etc.) that existed in 1993/94 taking into account the climatic and hydrologic conditions that were experienced in the year under consideration. [7]

3.10 In relation to the MDB caps, it is a matter of grave concern to the committee that 10 years after the beginning of negotiations designed to set a cap on river extractions, the cap for Queensland has still not been finalised. In its 2004 report, *Rural water resource usage,* the committee recommended that:

> A cap for water extractions in the Queensland part of the Murray-Darling Basin should be decided by the beginning of 2005.

3.11 The Chief Executive of the Murray-Darling Commission agreed that progress on cap implementation and other water reform aspects affecting the MD Basin had been slow and pointed to the difficulties inherent in getting several states to reach agreement on substantial issues:

> The original River Murray agreement in 1915 took 22 years to reach. Putting the cap in place took a decade. The agreement on environmental flows took a decade. Anything substantial takes a decade because you have to go through the whole process to get the information.[8]

3.12 The Murray-Darling Basin Commission does not expect the caps for extraction of river water in Queensland to be in place before sometime in 2007. [9] Settling the cap issue in some areas of Queensland is not an easy task especially since some stakeholders see their water extractions as having no effect further down river:

> The cap is inequitable and there have been distortions in the science of river flows and river ecology used to justify limits and cutbacks in water allocations…
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> …Much of the water from Queensland river systems does not reach the NSW border, let alone the Murray river. [10]

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7 MDBC, Water Audit Monitoring Report 2004-2005, Report of the Murray Darling Basin Commission on the Cap on Diversions, June 2006, p. 13. http://www.mdbc.gov.au/nrm/the_cap/wam_reports

8 Dr Wendy Craik, CEO, MDBC, *Committee Hansard*, 12 October 2006, p.3.

9 Dr Wendy Craik, CEO, MDBC, *Committee Hansard*, 12 October 2006, p.4.

10 *Submission* 56, Chinchilla and District Water Users Association, p.3.

3.13 Evidence to the committee suggests that the implementation of caps remains a key water management problem. Even where caps have been set, as in the NSW part of the Murray-Darling Basin, those caps are not always fully implemented. Inland Rivers Network Coordinator, Ms Amy Hankinson pointed out that:

> Flood plain harvesting is also meant to have been brought under cap in New South Wales, but it has not been done to date, which calls into question New South Wales cap compliance.[11]

3.14 The committee believes that all state governments involved in the NWI should take the steps necessary to abide by the commitments they have made in relation to the caps. The committee urges Queensland to take steps to finalise its negotiations and agree to a cap on its water extractions. This is an urgent and critical issue for the health of the rivers concerned and for the farmers and others who depend on those rivers for their livelihoods. It demands a much higher priority.

Measuring and reducing allocations

3.15 Over allocation results from lack of, or inadequate, knowledge about the rivers from which the water is taken. The need for broader knowledge and more precise measurement of rivers was recognised by various submitters to the committee ranging from Engineers Australia to the National Water Commission's Ken Matthews:

> We do not know nearly accurately enough where the water is, what it is being used for and what its state of health is, and that is not good enough... Unless water can be monitored and measured, it simply cannot be managed. Good water accounting is vital for not only economic purposes but also environmental management and good policy formulation. [12]

3.16 The Department of Agriculture, Fisheries and Forestry explained that one of the aims of the National Water Initiative (NWI) is for all states to work towards fair and sustainable allocation of water and redress as much as possible the negative impact of over allocation:

> The over allocations are intended to be dealt with by all the states, consistent with the National Water Initiative. The National Water Initiative indicates that, if structural adjustment is required, the Australian government will consider that on a case-by-case basis. In the meantime we need to improve the information base, and we are seeking to do that.[13]

3.17 In 2005, the Murray Darling Basin Commission responded to widespread concern about the accuracy of cap measurements by commissioning an audit of cap data management systems in the basin by Marsden Jacobs Associates. The auditors

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11 Ms A. Hankinson, Inland Rivers Network, *Committee Hansard,*15 September 2006, p.61.

12 Mr Ken Matthews, *Committee Hansard,* 7 March 2006, p.3, Engineers Australia, *Submission* 8.

13 Mr Simon Smalley, (DAFF) *Committee Hansard,* 7 March 2006, p.91.

recommended the establishment of an open registry of bulk off-takes in the basin. The Commission has now established the registry and a first report on the information it gathered, known as the Bulk Off-take project report, was published in October 2006. The report found that:

> Poor measurement method selection, poor installation and a failure to audit meter installation was found to be a common contributor to measurement inaccuracy. Verification of rating tables, which are used for assessment of flows for the majority of open channel diversion sites, occurs in all states. However, it is not done according to any prescribed standard. Only New South Wales conducts in-situ verification of the accuracy of meters on conduit structures. However, this in-situ verification does not occur in all valleys, is not targeted and is opportunistic.[14]

3.18 The Bulk Off-take project report also found that:

> It is probable that significant errors are occurring in measurement in all Queensland valleys. Problems include failure to verify measurement accuracies and to update flow rate equations when channel modification occur. A comprehensive metering program is planned for the Condamine-Balonne.[15]

3.19 In relation to the Barwon-Darling in NSW, reported diversions are estimated to be 40 per cent below those actually occurring. The committee notes that those findings confirm evidence given by several witnesses to its inquiry and referred to in paragraphs 3.41 and 3.42 of this report.

3.20 There is currently no national or international method standard for the measurement of bulk water diversions. The Commission's Bulk Off-take project report identified conduit measurement as an area of particular concern with propeller meters found to have a variation in accuracy of between one to 93 per cent. The Commission has asked all the states to report by March 2007 on how they propose to improve the accuracy of off-takes identified as having an unacceptable level of inaccuracy.

3.21 There are great technological advances being made in the area of real-time metering and monitoring of water use.[16] The committee urges all the states involved to take urgently all the steps necessary to improve the accuracy of reported water diversions from the river. This is a crucial issue for the long-term health of the Murray.

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14 MDBC, Improvement in accuracy of measurements of diversions and returns under the cap, October 2006, p.ii. http://www.mdbc.gov.au/nrm/the_cap/Improvement_in_accuracy_of_measurements_of_diversions_and_return_under

15 As above, p.iii.

16 NSW Irrigators, *Submission* 45, p.7, CSIRO, Water for a Healthy Country Newsletter, April 2006.

The Living Murray initiative

3.22 In recognition of the serious implications for the river's health and the survival of its communities and their economies, the MDB Ministerial Council (comprising the federal minister, together with ministers from New South Wales, Victoria, South Australia, Queensland and the Australian Capital Territory) established the Living Murray Initiative in November 2003. The aim of the initiative is to recover and return to the river, up to 500 gigalitres of water annually by the end of a five year programme. In its submission to the inquiry, the Department of Agriculture, Fisheries and Forestry stated that:

> Four water recovery proposals were approved by the MDB Ministerial Council in November 2004 (two from Victoria and two from NSW). These proposals will potentially recover up to 240 gigalitres of water each year at a cost of approximately $179 million. The Australian Government has indicated an interest in investing up to its maximum investment level of 40% of the costs of these projects, equating to potentially $71.6 million, with $42.7 million to be spent in Victoria and $28.9 million in NSW.[17]

3.23 In evidence, the Australian Conservation Foundation pointed to a recommendation by scientists that about 1,500 gigalitres would be needed if damage to the river were to be reversed:

> Even though in many cases that has been described as an environmental allocation, the environmental allocation is not adequate to deal with the environmental needs of the system.
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> One case in point was with the Living Murray, where the best available scientific recommendation was to recover 1,500 gigalitres for the river, and a decision was made to return 500 gigalitres to the river. Even in that instance we have made very poor progress in recovering water for the environment.[18]

3.24 CSIRO's Professor Young told the committee that the very survival of the river might be at stake:

> Conceptually, there is a base amount of water that all rivers need… Some people—and this involves some value judgements—would argue that the right way to do this, as the system gets drier, is to increase allocations to the environment so you still have a river which supplies water for recreation, for maintenance of flood plains and so forth. Alternatively, you can have a system in which, as it gets drier, we lose all of those assets.[19]

3.25 The need for a balance to be struck between consumptive use and environmental requirements in the Murray Darling Basin has been identified for more

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17 DAFF, *Submission* 41, p.17.

18 Dr A. Buchan, Australian Conservation Foundation, *Committee Hansard,* 15 September 2006, p.58.

19 Prof. M. Young, *Committee Hansard,* 7 March 2006, p.47.

than a decade.[20] Some controversy will always attach to any move to reduce water allocations to irrigators and farmers so that some water can be returned to the river. However, the committee's view is that in trying to find ways to ensure the health of the Murray and Darling rivers, everyone needs to recognise that it is unproductive to oppose 'environmental water' to 'agricultural water'. As the Murray Darling Commission states on its website, it is not just a question of sustaining the environment of the river and its aquatic ecosystems, "virtually all economic activity within the Basin" is at stake.[21]

Recommendation 5

3.26 The committee recommends that all state jurisdictions in the Murray-Darling Basin undertake a review of the current water allocations with a view to reducing diversion from the river.

The Condamine–Balonne catchment

3.27 More than a third of those who made submissions to the inquiry were farmers suffering from the effects of over allocation in northern New South Wales and Queensland. They expressed their concern and frustration about the parlous state of the lower reaches of the Birrie and Bokhara rivers, the Culgoa, Condamine-Balonne and the Lower Balonne flood plains.

3.28 Mr Ed Fessey, a member of the Lower Balonne Floodplain Graziers Association, described the impact water over allocation is having on downstream families and communities, in the following way:

> Basically the unsustainable and irresponsible over allocation of water in the Lower Ballone has had a profound effect on many families. My submission details the cost of providing alternate water supply and the average loss on income – grossed up over a 10-year period to some $450,000. The alternate water system cost us $104,000 to replace and we are still paying that off, with no subsidy from the government. I know of 27 other businesses which have had similar problems. This is largely due to the reduced income and reduced river flows in the Lower Balonne.[22]

3.29 Robert and Ann Senior, landholders from the Brewarrina district, told the committee that their property – originally purchased some 50 years ago for its beneficial flooding – is struggling even to get stock water:

> Our floodplains country is totally dead and our trees are dying at a rapid rate. Before the development of the irrigation our country was flooded on

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20 Toyne, P. "Water use and environmental flows in the Murray-Darling Basin" in Proceedings of the Water Use and Environmental Flows Workshop, 22-23 August 1995. Murray-Darling Basin Commission, Canberra.

21 Murray Darling Commission, The impact of water regulation and storage on the basin's rivers, http://www.mdbc.gov.au/nrm/water_issues/impact_of_water_regulation_and_storage

22 Mr Ed Fessey, *Committee Hansard*, 16 August 2006, p. 4.

> an average at least once every 12 months, even in the past receiving some beneficial flooding during drought years.[23]

3.30 Another witness called for a moratorium on floodplain harvesting:

> **Mr Treweeke**—Basically, to do away with flood plain harvesting. As we have said, that is the inequitable portion of this. It cannot be measured accurately and it has allowed people to gazump others who are legitimately in a queue in a process sanctioned by the water act at the time. I think that if that were removed and proper environmental studies done of the impact of water extraction, it would help.[24]

3.31 Graziers from the area argue that, even when the drought situation in their region over the last 10 years is taken into account, the lower reaches of those rivers on which they depend are being destroyed as a result of over allocation of the water available to irrigators 'upriver'. Mr Fessey, pointed out that even when there is more rainfall in the area than there was 25 years ago, the Lower Balonne river and its floodplain are now drier because of the large amounts of water that are being diverted upstream, especially in times of flood because of an erroneous assumption that water flowing over the banks is wasted if it is not stored.[25]

3.32 Access to overland flow water has been granted to the irrigation industry generally with no requirement that it be metered or accounted for in any way (and free of charge in Queensland), further encouraging the building of off-river storages, the numbers of which have grown exponentially since the mid-eighties.

3.33 The following graph from Professor Kingsford's submission illustrate the dramatic increase in the number of private dams and in dam storage capacity in the Condamine-Balonne catchment area.

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23 *Submission 10,* Mr Robert and Ms Ann Senior, p. 1.

24 **Mr Rory Treweeke,** *Committee Hansard*, 16 August 2006, p. 15.

25 Mr Ed Fessey, *Committee Hansard,* 16 August 2006, p. 5.

Growth in off-river storage in the Condamine-Balonne catchment area

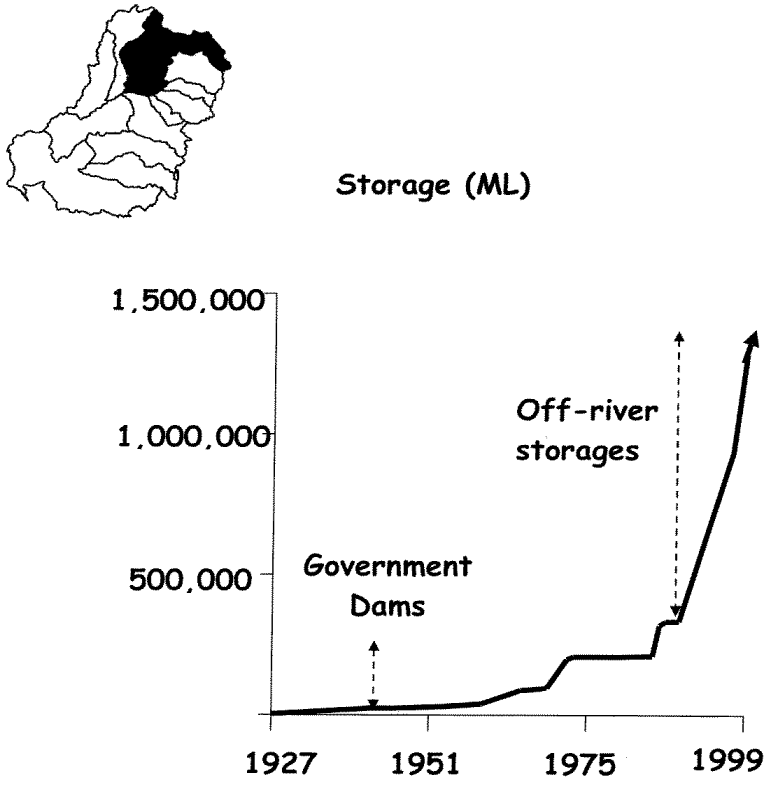

Fig. 4. Cumulative storage capacity of dams in the Condamine-Balonne catchment of the Murray-Darling Basin, showing the cumulative capacity of Government built dams relative private off-river storages.

Provided by Prof. Richard Kingsford, (Uni.of NSW), Submission.9, p.7

3.34 The situation of the northern NSW floodplain farmers who made submissions to the committee is mirrored in the lower reaches of the Murray river where according to the South Australian government submission:

> Drought-like flows are now experienced in the lower reaches of the River Murray 60 per cent of the time, compared with 5 per cent before river regulation and development.[26]

3.35 Diversion of flood waters to storage for irrigation has an economic and social impact not only on floodplain farmers and the communities in which they live but also on the original dwellers of the floodplains, the indigenous peoples of the river area.

Impact on local indigenous peoples

3.36 Several submissions and evidence from graziers in the Lower Balonne area referred to the negative impact of reduced or no river flow on the indigenous people of

26 SA Government, *Submission* No.52, p. 10.

the area. Mr Edward Fessey who leases 'Weilmoringle Station" from the Indigenous Land Corporation of the area had this to say:

> The Muruwari community, who live there, consider the river to be the most important feature of this land. They are deeply disappointed and angered at the way the river has been changed to such an extent that they can no longer even rely on it for water for their community. The prospect of a flow in the river causes much excitement and gives the people a spirit of renewal as the fish start to come up from the Darling River.[27]

3.37 This view was supported in evidence to the committee by Mr Steven Ross of the Wamba Wamba people from southern New South Wales and the coordinator of the Murray Lower Darling Rivers Indigenous Nations (MLDRIN):

> one thing MLDRIN, and the confederated traditional owners within MLDRIN, always push is that the health of the river is definitely connected to the health of the people. The Yorta Yorta have that in their Dreamtime stories: they believe that Lake Barmah and Lake Moira act as kidneys for the river and actually clean the water as it goes through those ecosystems. Western evidence also shows that when water goes through the Barmah Choke it comes out much cleaner at the other end. The Yorta Yorta relate that to the health of their own people.[28]

3.38 He welcomed the provision under the National Water Initiative that allows water to be allocated to native title holders although the capacity for traditional owners to gain access to native title is limited in southern New South Wales, Victoria and South Australia. Mr Ross called for a holistic approach to river management that recognises what traditional owners do for the protection of rivers and things that they would like to see done such as "resnagging, reforestation and protection of Indigenous sites. [29]

The floodplain as part of the river

3.39 In his submission to the committee, Professor Richard Kingsford of the University of NSW explained that the way a river was perceived and defined when the first water legislation was being developed last century made it impossible to consider the floodplain as part of the river:

> Most of Australia's legislation for river was derived from English legislation where rivers are considerably different. So until relatively recently most of Australia's legislation, policy and management left out floodplains, the vast majority of a river. In NSW, floodplains equate to about 88% of a river's area and more than 95% of this is owned by landholders who will be affected by changes in river flows.[30]

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27 Mr Ed Fessey, *Submission* 20, p.1.

28 Mr Steven Ross, *Committee Hansard* 15 September 2006, p.54.

29 Mr Steven Ross, *Committee Hansard* 15 September 2006, p.51.

30 Professor Richard Kingsford, (University of NSW), *Submission* No.9, p.5.

3.40 Professor Kingsford's argument is that the overflow is essential to the survival of the river downstream, its floodplains and wetlands and the floodplain landowners whose livelihood is based on receiving the occasional flood. Water that infiltrates into the flood-plain contributes to aquifer recharge which also ultimately impacts on downstream flow. In a joint submission to the committee, the Australian Conservation Foundation and Inland Rivers Network stressed the importance of including overland flow in river protection:

> Overland flow is linked to downstream river flow. It makes an important contribution to natural flow variability and the connectivity of floodplains with river channels. Harvesting overland flow for storage and subsequent irrigation use has huge implications for downstream river and wetland health, as well as on downstream users, and must be addressed immediately. Immediate resolution of this conflict is needed to provide greater certainty and fairness to non-irrigation water users and the environment.[31]

3.41 Inland Rivers Network was very critical of the water management situation on the floodplains of New South Wales:

> In a recent release of environmental water in the Macquarie Marshes, there were a number of photos taken that actually demonstrate water being siphoned off, through channels and well-placed banks into ring tanks and large storage dams, and down channels to go across other paddocks. That is water that has come directly from the wetland during this specific release of environmental water.
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> …As far as I am aware, none of the departments have made moves to investigate this further. There has been a public statement from the Department of Natural Resources that they are investigating it, but I spoke to their compliance department and they said they had no real idea of what was happening.

3.42 On the Queensland front, Ms Moles from the Toowoomba and Region Environment Council had this comment about compliance:

> On the matter of compliance, the environment movement believes that compliance is not taken terribly seriously by governments. I have personally heard a lot of people—not just graziers but also some irrigators—complaining about water being stolen. Obviously, I do not know whether or how much of these allegations are true, but there is a widespread belief out there that the penalties for breaching licence conditions are a 'joke', 'totally inadequate' and 'a trifling business expense' and that a much more effective tool for ensuring compliance would be a reduction, perhaps temporary, in one's water allocation.[32]

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31 *Submission* 38, ACF & Inland Rivers Network, p.6.

32 Ms Sarah Moles, *Committee Hansard,* 2 August 2006, p.62.

3.43 The committee believes that state governments have a greater role to play in the management of the flood plains, unregulated rivers and streams in their jurisdictions. While not all the banks and channels referred to in evidence have been built illegally, the relevant jurisdictions have a responsibility to police the construction of illegal banks and levees and to ensure that when environmental water is released, it reaches the wetland, such as the Macquarie Marshes cited above, for which it is intended and not diverted illegally for other purposes. If this is not policed, taxpayers' funds used to regain water for the environment would have been wasted.

Recommendation 6

3.44 The committee recommends that state governments take whatever steps necessary to ensure the removal of privately-built levees and interceptor banks from the flood plains to allow environmental water to flow to the wetlands for which it is intended.

3.45 Several submitters expressed concern at the impact of large-scale irrigation on the Gwydir and its wetlands in north west NSW. The Gwydir Wetland is recognised internationally under the Ramsar Convention and also in the China/Australia Migratory Birds Agreement (CAMBA) and the Japan/Australia Migratory Birds Agreement (JAMBA). Of 235 different species of birds recorded in the Lower wetlands alone, some 134 use the area for breeding. In a wet year (1998) as many as 500,000 birds were recorded in the area. In 1999, a group of private landholders in the area together with representatives of WWF—Australia and the National Parks Association signed a Memorandum of Understanding with the Commonwealth and NSW government ministers responsible for future cooperation and management of a portion of the Lower Gwydir Wetland - a first for NSW. Some of those private landholders made a submission to the inquiry pointing to the failure of both governments in honouring their commitment to maintain appropriate flows and assist them in managing issues such as weeds. The MOU stated in part:

> Both Governments remain committed to maintaining appropriate hydrological regimes in the Gingham and Lower Gwydir Watercourses, particularly the provision of adequate, ecologically appropriate environmental flows to the wetlands." [33]

The landholders' evidence to the committee, referring to the MOU's commitment, was that: "These have proven so far to be hollow words."[34]

3.46 Another landholder, Ms Wendy Bunce made several submissions to the inquiry and told the committee:

> The alarming collapse of kilometres of fragile Gwydir river banks upstream of the Tareelaroi weir escalates daily and more and more regulated waters are continually released from Copeton dam regardless of the wretched

33 Mrs Terry Murphy-Fleming, Mr Phillip Fleming & Mr Howard Blackburn, *Submission 54,* p.1.

34 As above.

> (documented) destruction these regulated waters are causing to the environment. The Gwydir river is being used by the water authorities and the flood irrigation industry as a huge regulated irrigation channel and it simply cannot cope.[35]

3.47 Ms Bunce quoted a letter from WWF—Australia to the federal Minister expressing concern about the ecological integrity of the Macquarie Marshes as well as the Gwydir Wetlands and the Wilgara Wetland. Valley Ramsar. WWF called on the Commonwealth to make future funding of the Catchment Management Authorities (CMAs) conditional on plans demonstrating how hydrological prescriptions will help maintain the ecological character of those wetland and Ramsar sites.[36]

3.48 The committee notes that the Commonwealth, under its Water Smart Australia scheme and the NSW governments have now recognised that the northern NSW wetlands have been under severe ecological stress. In August 2006, both governments announced that $26.8 million (jointly-funded) had been allocated to a NSW Wetland Recovery Plan targeted at the Gwydir Wetlands and the Macquarie Marshes in particular.[37]

Better data about rivers

3.49 Although a substantial amount of scientific information is now available about river systems and catchments, the data is scattered reflecting the fact that the research and data collection work is being carried out by different universities, by hydrological experts, ecologists, water storage engineers and different governments. Professor Kingsford told the committee in evidence that he is working on making all the available information about river catchments available on a single website:

> For some time now, and I will only briefly describe this, one of my projects has been to collect all of the information for a catchment and make it available on a website so that people can look at a map and just find out about it. A lot of scientific information for our rivers, by the very nature of what science is, is published in international journals and it is not very accessible to most people. It is difficult, and even policy makers do not have quick access to that. So I have been trying to break down that barrier.[38]

3.50 That information is available at:

http://wiserivers.nationalparks.nsw.gov.au/Multimedia/index.html

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35 Mrs Wendy Bunce, *Submission* 59, p.7.

36 Mrs Wendy Bunce, *Submission* 59, p 9.

37 The Hon. Ian Turnbull, Parliamentary Secretary to the Prime Minister, Press Release, 18 August 2006.

38 Professor Richard Kingsford, *Committee Hansard,* 18 October 2006, p.16.

3.51 The committee commends Professor Kingsford for his work in attempting to gather all the relevant data about rivers and catchments in one database. The committee is very keen to see more data about rivers and water collected and made publicly available, so that decisions about water allocations can be based on the best available science. Data will always be incomplete, but sound decisions about flow rates, timing and the volume of water that each irrigator can depend on must be made in response to each particular ecosystem. It is important to have more accurate data on how much water each river needs for its survival and support of a flourishing riverine environment.

3.52 Cubbie station is situated on the alluvial flood plain between the Culgoa and the Balonne Minor river systems. The property currently irrigates a maximum area of 20,000 hectares with cotton as its main crop and hopes to possibly increase this to 30,000 hectares. The Cubbie group has water storage capacity totalling 537 gigalitres comprising 462 gigalitres at Dirranbandi and 75 gigalitres at St George.[39]

3.53 The water Cubbie extracts from the river is metered in accordance with Queensland government requirements but at the moment there is no requirement for flood plain extractions to be metered and they won't be measured and audited until the Water Resource Plan for the Lower Balonne system is finalised by the Queensland government, however Cubbie station has always provided this information to the department. Cubbie told the Committee in evidence that:

> Cubbie reports daily what its extractions are from the flood plain.[40]

> The water that we do take off the flood plain… enters the system via pumps or pipes. You know what those pumps pump. There are head drop tables that apply to every pipe structure so you know instantaneously and on a daily basis the volume that is being diverted. [41]

3.54 Referring to Cubbie's extractions from the flood plain, Mr Grabbe argued that some of the water flowing over the bank in times of flood is "lost" to evaporation and would be wasted if Cubbie was not intercepting it and storing it:

> The volume of water that Cubbie takes off its flood plain is equivalent to the volume that would be naturally consumed within its levee area—that is, where we have constructed our scheme was a total flood plain…. The amount of water we divert is the water that would have naturally been lost in that area if the levees were not there.

3.55 Referring to the 2004 flood event, he further stated:

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39 Mr Paul Brimblecombe, *Committee Hansard*, 2 August 2006, p.17-18.

40 Councillor Buchan, *Committee Hansard*, 2 August 2006, p.21.

41 Mr John Grabbe, *Committee Hansard*, 2 August 2006, p.27.

> If our system of levees did not exist, those 45,000 megalitres would not have gone anywhere. It would have been naturally consumed by the flood plain where our levee system sits.[42]

3.56 The Cubbie Group also stated in its submission that it can prove that the impact of its floodplain water harvesting on downstream flood plain flow is zero:

> Cubbie can show by measurement and by physical inspection that the volume of water that it consumes (harvests) from its floodplain is equivalent to the volume that would be naturally consumed by the three naturally occurring forces (seepage, evaporation and natural residual pools along the floodplain.) In other words the impact on downstream floodplain flow by Cubbie's station floodplain harvesting is zero.[43]

3.57 However, in response to questions from committee members, Cubbie station's managers acknowledged that the water contribution from the flood plain to the aquifer is not known currently so they were unable to quantify at all as there has been no study.[44]

3.58 The committee wants to make it clear that it is not suggesting that Cubbie has done anything illegal or improper by installing pumps and building levees, retaining walls and water storages to harvest water from the flood plain. Nor is the committee challenging the quality of the river water downstream from Cubbie's water storages. The committee recognises that Cubbie allows enough water to flow in the river to maintain water quality and for the river's biodiversity to be maintained. The same cannot be said of the flood plains, which according to Professor Kingsford, equates in NSW, to about 88 per cent of a river's area.[45]

3.59 Under the National Water Initiative, the approved volume of water that can be extracted from any river is set in the Water Resource Plan for each area. The plan is a statutory document. As stated in paragraph 3.58, Cubbie operates within the Queensland Water Act 2000. Queensland is a signatory to the National Water Initiative and is working on developing Water Resource Plans for each of its irrigation areas. The final WRP for the Condamine- Balonne was gazetted on 12 August 2004.

3.60 Resource Operations Plans (ROP's) are the mechanism through which the Water Resource Plans are implemented. ROPs define water entitlements, entitlement performance measures and establish water trading. In Queensland, they are currently being developed through a process of consultation carried out by Ministerial Advisory Councils that advise the Queensland Minister for Natural Resources and Mines.

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42 Mr John Grabbe, *Committee Hansard* 2 August 2006, p.41.

43 Cubbie Group Ltd. *Submission* 55, p.2.

44 Mr John Grabbe & Mr Brimblecombe, *Committee Hansard* 2 August 2006, p.18.

45 Prof. Richard Kingsford, UNSW, *Submission* 9, p.4-5.

3.61 A large number of flood plain land holders in New South Wales, downstream from the Balonne river, depend on Queensland Water Resource Plans and associated ROPs to ensure that they receive a share of water in order to continue sustainable farming on the flood plains. In submissions to the committee's inquiry, several of those stakeholders expressed concerns that their views and interests could not be fairly represented to the Queensland Minister by the Chair of the Ministerial Water Resources Advisory Council. A number of landholders in the area felt so strongly about the issue that they withdrew from the consultative process. The minority that did not participate expressed the view that:

> All NSW landholders and many Qld landholders have refused to participate in the Ministerial Advisory Council for the Resource Operations Plan on the Lower Balonne as we believe the appointed chair is not financially or geographically independent of the system and that we will not get fair representation.[46]

This view is disputed by many others involved with the council.

3.62 The Chair of the Ministerial Water Resources Advisory Council had also been the chair of the Lower Balonne Community Reference group (CRG) which had made a submission on behalf of that area to the Queensland minister when the Water Resource Plans (Condamine & Balonne) was being developed in 2004. It is imperative that people who chair consultative committees are seen not to have a conflict of interest.

3.63 In evidence to the Committee, Mr Ed Fessey explained that in spite of the withdrawal of the non-irrigators, the representatives of environmental groups and some of the indigenous groups from the consultative process:

> The process is ongoing. They are still holding minuted meetings and subcommittee meetings to determine the flow rules and the flow operation rules.[47]

3.64 When the committee brought to her attention the complaints about the MAC's Chair lack of impartiality and the possible conflict of interest, the Chair responded that:

> Every member of the Lower Balonne Water Resource MAC has a vested interest in the management of water resources in the Lower Balonne. In order to ensure that members, the community and the Minister are aware of those interests a register of interests is kept.
>
> The Council is advisory only as it is clearly recognised that it would be inappropriate to devolve to a local community the decision making

46 Rick & Helen Hall, *Submission* 19, p.1.

47 Mr Ed Fessey, *Committee Hansard,* 16 August 2006, p.10.

responsibility for sharing a scarce resource. It is not the only mechanism for providing advice to the Queensland Government.[48]

Diverting water from the flood plains

3.65 In the Australian context, diverting floodwater before it reaches the lower flood plains has a massive impact on agriculture, the wetlands and ecosystems and every aspect of the life of the communities living downstream. Many of the flood plain landholders who have made submissions to the committee's inquiry are facing financial hardship and in some cases, possible ruin as a result of water being diverted away from the flood plains. For some, even water for their daily needs is threatened and they face having to abandon farming in areas where their families have farmed for generations. Many express feelings of frustration at being cheated by a system over which they have no control.[49]

3.66 The evidence to the committee from the flood plain farmers further downstream points clearly to the fact that in addition to the lack of water they experience because of the prolonged drought, they have experienced severe hardship through having the overland flows that they were used to experiencing cut off.

3.67 There is currently no requirement for flood plain extractions to be metered, a failure identified since 2000 as having a big impact on extraction levels on the rivers in the Murray- Darling Basin since in NSW, the flood plains equate to about 88% of a river's area.[50] The MDB Commission's CEO told the committee that the Commission is now taking steps to develop a system for measuring flood plain harvesting.[51] The committee welcomes this initiative since the measurement of flood plain harvesting is essential, not only for the long term viability of the rivers and their aquatic ecosystems, but also for the viability of almost all economic activity within the Basin.

3.68 The committee's strongly held view is that interference with the natural flooding regime of the Lower Balonne system has had a severe effect on some 1.2 million hectares of flood plain on which the dryland farmers, graziers and indigenous people of the area depend. [52] Of even greater concern is the fact that the real ecological damage may not be known for several decades. In that context, the committee notes Professor Peter Cullen's often quoted remark urging the cautionary principle in the face of inconclusive scientific evidence on environmental matters: "by the time you get the science right, the patient is dead".

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48 Mrs Leith Boully, Correspondence to the Committee, Jan. 2006, Tabled document.

49 *Submissions* Nos. 16, 19, 20 26 & 29.

50 Prof. Richard Kingsford, UNSW, *Submission* 9, p.4 -5.

51 Dr Wendy Craik, CEO, MDBC, *Committee Hansard*, 12 October 2006, p.16-17.

52 Mr Fessey, *Committee Hansard*, 16 August 2006, p.4.

3.69 The Condamine-Balonne has more wetland and flood plain (around 1.2 million hectares) than any other catchment within the Murray-Darling Basin. According to one view expressed by Professor Richard Kingsford, a lot of the vegetation on those flood plains is threatened because of the amount of water that is being taken out of the flood plains. In his view, the "real impacts" will take time to be documented:

> You have to imagine that a lot of the plants and animals that we have on the river system have had tens of thousands of years to evolve to not getting a flow every now and again, so it takes them a long time to die. [53]

3.70 The committee's is aware of the moratoriums now in place in the Condamine-Balonne and Border Rivers catchment that place holds on all new applications for water licences and prohibit the commencement of new works for the taking and interfering with water, including overland flows. The committee notes also that the Condamine-Balonne Water Resource Plan makes provisions for "the regulation of the take of overland flow water through the catchment ensuring more water for the environment and downstream users."[54]

3.71 While it is commendable to make provision for regulation of the overland take, the committee's overwhelming concern in this matter is that the current levels of irrigation and the volume of water diverted from the rivers and flood plains from the Condamine-Balonne catchment has been claimed to be unsustainable. In making the recommendation that follows, the committee wishes to stress that it is essential for its proper implementation that the granting of licences should only happen after (and not before) the current levels of water extraction from the flood plains have been assessed as part of the independent scientific review that it recommends and after the results of that review have been published.

Recommendation 7

3.72 The Committee recommends that all state and territory jurisdictions review the levels of water diversion from the flood plains and only grant licences to extract overland water after an independent scientific review of current levels of extraction has been completed.

An alternative approach

3.73 Reducing the level of over allocation from rivers and flood plains in the Murray-Darling Basin is one of the major goals of the National Water Initiative. Some irrigation areas in both New South Wales and Victoria have already faced issues of

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53 Prof. Richard Kingsford, *Committee Hansard*, 18 October 2006, p.15.

54 MDBC, Water Audit Monitoring Report 2004-2005, Report of the Murray Darling Basin Commission on the Cap on Diversions, June 2006, p.39.

sustainability and seen their water licences re-allocated to different crops than the one for which the licence was obtained originally.

3.74 Historically, incentives in the tax system have encouraged growers in some areas to plant cotton on a large scale by reason of the tax deductability of the capital infrastructure involved. They are now facing a depressed cotton market and reduced water availability. The committee's view is that it would benefit many of the growers and help address the current problem of water over allocation from the flood plains, if an incentive package were put in place that would ensure the continuing prosperity of irrigation areas while giving cotton growers an opportunity to diversify into less highly water-reliant crops.

3.75 Such a package would require amendments to the *Income Tax Assessment Act 1997* and to the *Managed Investments Act 1998* to make it more attractive to invest in a range of crops that are known to need less water per acre. It would require for instance that, instead of a situation where the Managed Investment Scheme (MIS) applies as a general exemption as it does currently, access to the MIS scheme would only be available if specific crops (whether peanuts or horticultural crops) and specific irrigation methods (for example, trickle irrigation) and farm management methods were used.

3.76 A balance needs to be found between ensuring the long-term sustainability of the regional economies dependent on cotton and the sustainability of the rivers and flood plains. The test of whether an incentive scheme was successful would be whether a substantial amount of water was being returned to the river and the flood plains and whether the continuing prosperity of those regional areas that are built around large-scale irrigation is guaranteed through the planting of high-value crops. The potential return to the Australian economy from exporting those crops would also need to be taken into consideration.

3.77 The committee urges the Australian government to investigate the beneficial trade-offs that could be devised through tax incentives and other related measures such as the MIS, to encourage growers to move away from planting cotton in the Murray-Darling Basin alluvial plains that are currently over allocated. Growers would have a choice of whether to access the tax benefits available under the scheme by moving to alternate crops or to remain with the status quo.

Recommendation 8

3.78 The committee recommends that the Australian government consider putting in place incentives and initiatives to encourage growers and irrigators to move into alternate crops that allow for a substantial amount of water to be returned to the rivers and flood plains of the Murray-Darling Basin.

Groundwater

3.79 As it becomes more costly and more difficult to meet the growing demand for water from surface water resources, both rural and urban users have turned to

pumping groundwater as a way to solving water shortage problems. While in some states some of those bores are licensed, very few of them are metered, making it extremely difficult to track levels of extraction and develop data on sustainable yields. There seems almost to be an implicit assumption that groundwater is limitless. The reality is that groundwater is not available in addition to surface water and in many cases, extraction from one source may be leading to the depletion of the other.

3.80 While great progress has been made in hydro-geology in recent years, it remains a complex and inexact science. Although it is known that some aquifers are connected to streams, there is limited knowledge about the exact interaction between surface and ground water in many areas, and we lack long-term data on the effects of groundwater pumping on the sustainability of our aquifers.

3.81 CSIRO and the Murray Darling Basin Commission have identified groundwater extraction as one of the six significant risks [55] facing the Murray-Darling Basin that could eventually reduce the amount of water available in its rivers and streams. The paper quoted estimates of current losses of 327 GL of water from the basin because of groundwater pumping and studies that predicted a further reduction of 253 GL by 2012/13. The committee notes also the 2003 report by Sinclair Knight Merz which has estimated an average reduction in surface flow of 600ML for every 1000 ML of groundwater use.[56]

3.82 It is of even greater concern that scientists are warning that, in addition to the immediate negative impacts on surface flows and groundwater stores, the long term impacts of sustained groundwater extraction may be of greater consequence:

> In connected groundwater-surface water systems, there is normally a time lag of years or decades between the start of groundwater extraction and the moment the full impact of that pumping is felt in the streams…even if all groundwater pumping were to cease immediately, there will be an ongoing impact in streams due to historical pumping.[57]

3.83 The Murray Darling Basin Commission's 2004-2005 Water Audit Monitoring Report shows that the Commission is finally implementing the Ministerial Council's August 2000 decision to develop a Groundwater Management Strategy and integrated reporting framework for surface and groundwater. The Audit report quotes some worrying figures:

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55 Van Dijk, A., Evans, R., Hairsine, P., Khan, S., Nathan, R. Paydar, Z., Viney, N. and Zhang, L. (2006) Risks to the Shared Water Resources of the Murray-Darling Basin. *Murray- Darling Basin Commission Report*, Canberra, p.6.

56 Sinclair Knight Merz, Projections of groundwater extraction rates and implications for future demand and competition for surface water. Report to Murray-Darling Basin Commission, Canberra 2003.

57 Van Dijk, A. and others (2006), *Murray- Darling Basin Commission Report*, Canberra, p.19.

> The estimated sustainable yields in Groundwater Management Units (GMU) of the Basin are reported to be 1534 GL (note Victorian SY values are not available). Out of this, 2950 GL was already allocated in 2004/05, which constituted 192 % of SY. The total usage of groundwater in the Basin was 1490 GL, which was 51% of allocation and 97% of SY.[58]

3.84 The committee is aware that not all allocations are in use at the present time but those statistics tell of a continuing story of unsustainable allocation in the basin. The committee urges all state governments involved to review groundwater allocations in the MDB. It is also imperative that those governments exercise the utmost caution in granting licences for groundwater extraction in cases where little is known about the aquifer in question. The data available is improving greatly and it is important to assess what the sustainable yield is before granting access to any aquifer.

Recommendation 9

3.85 The committee recommends that all state and territory government signatories to the Murray-Darling Basin Agreement undertake a review of groundwater allocations in the basin with a view to bringing back allocations to a sustainable level.

Protecting Northern Rivers

3.86 As discussed earlier in this chapter, many of the river systems in Australia are over-allocated and degraded, suffering from the excessive demands brought about by their proximity to our agricultural and residential zones. Fortunately, this is not the case for the rivers in Australia's tropical and semi-arid zones. Australia's northern rivers have the advantage of not being in heavily populated areas compared to the Murray. The Northern Territory has some 140,000 kilometres of rivers and creeks that are identified as being largely undisturbed.

3.87 Various submissions to the committee called on governments to agree to grant special protection to those rivers that are still in a relatively pristine condition to ensure that they do not suffer the fate of the Murray. Environment Centre, NT Inc. expressed concern about pressure for the granting of water licences in the Daly River catchment in the Top End:

> The catchment has long been targeted for large-scale irrigated agriculture and more intensive pastoral activity, which would involve increased surface and ground water extraction and native vegetation clearing. In late 2003 a moratorium on land clearing…was imposed by the NT Government.
>
> There is no official moratorium on water licence approvals however. There are currently 79 applications for a total of 51,655 Megalitres per annum (by 2010) currently being assessed by the NT Government (NT Government:

58 MCDC, Water Audit Monitoring Report 2004/05, p.63. http://www.mdbc.gov.au/nrm/the_cap/wam_reports

> *pers. comm*. 17/01/06). Should these be approved, this would result in a threefold increase in approved water extraction from the catchment by 2010, compared to the approved level in 2004.

3.88 WWF–Australia also called for greater protection for the northern rivers through the establishment of an Australian heritage river system:

> For a relatively small amount of money, the Commonwealth along with the states, territories and catchment groups could really leave a great legacy of these assets for decades and centuries to come.[59]

3.89 In evidence to the committee, the Northern Australia freshwater manager for WWF–Australia, Dr Stuart Blanch warned that it was important to hold back from taking decisions about rivers and aquatic systems in the north until more data had been collected:

> One of the knowledge gaps we have is: how can you trade water in these rivers when they are dry for six months of the year and for another three months of the year there is too much water and everyone has to leave and go to Darwin? There is lot of knowledge to be gained about that. The legal frameworks in the north are generally pretty underdeveloped compared to the south. We certainly could fill up a decade of knowledge by just mapping all the wetlands and where the groundwater is. A lot of that is not known.[60]

3.90 The Committee supports the development of management plans, based on research and community consultation, that ensure that the northern rivers that are in natural or largely natural condition are adequately managed with a view to protect their pristine ecosystems and to safeguard them from the over-allocation problems that are proving so difficult to resolve in the Murray-Darling Basin.

Recommendation 10

3.91 The committee recommends that Commonwealth, State and Territory governments should identify and protect all high conservation value aquatic ecosystems by 2010.

Recommendation 11

3.92 The committee recommends that water plans be developed in line with the National Water Initiative to prevent the over-allocation of water in rivers that are in a natural or largely natural condition.

Northern Australia Irrigation Futures

3.93 While the south and east of the continent has been experiencing severe long-term drought, there has been plenty of rain falling in the north of Australia where

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59 Dr Blanch, *Committee Hansard* 15 September 2006, p.8.

60 As above, p.12.

tropical rivers discharge about 70 per cent of the nation's available fresh water. The committee received submissions suggesting ways of tapping into the water available in the north and transporting it to the south-eastern states where the majority of the people and farms are located.[61] However attractively simple such an idea may sound, it is not workable in practice.

3.94 In anticipation of increased pressure for large scale irrigation schemes to be established in northern Australia, the Australian government, through the National Programme for Sustainable Irrigation has established the Northern Australia Irrigation Futures project to examine whether irrigation should occur in that part of the country and if so, where it should be located and how it should be managed? In addition to the Commonwealth, partners in the project include the Northern Territory, Queensland and Western Australian governments, CSIRO and the CRC for Irrigation Futures. In its submission to the committee, DAFF explained that the project had three components:

> a Sustainability Framework to support more robust debate and improved decision making regarding if and where to irrigate in tropical Australia;
>
> Tropical Groundwater Systems research that focuses on developing improved understanding of water in the tropics, particularly tropical groundwater systems and likely risks to groundwater and connected surface water systems if used for irrigation; and
>
> Irrigation Mosaics research into developing a conceptual understanding of the differences between traditional large scale irrigation systems and mosaics involving irrigation of smaller discrete patches of land dispersed across tropical landscapes.[62]

3.95 The project was launched in 2003 and stage 2 is now underway. In stage 2, a review of the institutional frameworks from the Daly, Ord and Burdekin irrigation areas has been undertaken and the findings compared. A study of tropical groundwater systems and their interaction with surface water systems is also being carried out. The scientists involved are aware that traditional irrigation practices are unlikely to work in the tropical north and are exploring the use of the irrigation mosaics approach.

3.96 The committee supports the work of the Northern Australia Irrigation Futures project as an important addition to the options that need to be explored in the quest to adapt to climate change and the consequent decrease in the water resources available in the populous and heavily farmed south-east of the country. The committee believes however, that an audit of the freshwater resources and of the land available for agriculture in Northern Australia needs to carried out before decisions can be made about the feasibility of establishing further irrigation schemes up north.

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61 *Submissions* 14, 62.

62 DAFF, *Submission* 41, p.35-36.

3.97 As discussed earlier in this report, it is proving difficult to bring together the valuable information being gathered by the many research projects relating to climate science, water resources and water and irrigation management around the country. The committee believes that it is important to bring responsibility for funding and disseminating information about all those activities within one portfolio.

Recommendation 12

3.98 The committee recommends that an audit of the freshwater resources and of the land available for agriculture in Northern Australia be carried out as part of the Northern Australia Irrigation Futures project.

Recommendation 13

3.99 The committee recommends the creation of a federal Ministry for the Future that would bring together the areas of climate change and water resources.