

15 Indigenous participation in water planning and management

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Mouth of Daly River, Northern Territory
Photo: Mat Gilfedder, CSIRO

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1. KEY POINTS

1. Water is of great cultural, social and economic significance to Indigenous societies and has been managed through Indigenous governance and management systems for thousands of years.
2. Indigenous rights and interests in water governance and management have been neglected in Australia. This is reflected in low rates of Indigenous access to water, participation in water management institutions and Indigenous awareness of water reform objectives and processes.
3. The National Water Initiative (NWI) has an overarching objective to recognise Indigenous needs 'in relation to access and management', including the provision of water for the protection of native title. Objectives are couched in broad and general terms, often discretionary and hence subject to variable interpretation and subsequent implementation. Detailed objectives are likely to manifest as implementation efforts that correspond with indigenous aspirations.
4. There are substantial barriers to effective implementation of the NWI, including:
 - a. lack of political and broader community understanding about Indigenous water rights, values and management responsibilities,
 - b. difficulties facing appropriate Indigenous representation in local, regional and policy-level decision-making,
 - c. technical difficulties in quantifying Indigenous water requirements,
 - d. absence of institutions and techniques to apply adaptive approaches to guide, monitor and evaluate Indigenous participation in water resource planning and management,
 - e. low capacity for collaboration within the Indigenous sector and water planning agencies.
5. The NWI could be expanded and strengthened to include Indigenous interests in two ways:
 - a. Indigenous people contest the NWI's assumption that water is vested in the Crown, and governments' role is to allow other parties to access and use water. This impasse could be partially overcome through the achievement of integrated water planning, collaboration and co-management.
 - b. There is ambiguity in the NWI about native title holders' assignment of consumptive water entitlements and seasonal allocations; hence access to water markets if established. Special measures, such as water trusts and Indigenous reserves, could enable Indigenous people derive long term livelihood benefits and institutions from the water economy.

2. POLICY CONTEXT

The NWI Agreement requires jurisdictions to provide for Indigenous access to water resources through planning processes and inclusion of Indigenous customary, social and spiritual objectives in water plans. Native title interests in water are to be taken into account and Indigenous water use assessed and addressed in plans.

In many water management contexts across Australia Indigenous groups are seeking to re-negotiate the terms of engagement with governments. Attention is being placed on water resource governance, with Indigenous groups seeking to assert their rights, create inclusive processes and collaborative relationships based on recognition of cultural differences, including Indigenous law and custom, and economic need (see (Lingiari Foundation 2002)). Some Indigenous groups are now engaged in water policy development and have argued that further policy action is required to ensure that the development of Australia's water resources provides economic benefits to Indigenous people. Indigenous voices (e.g. Murray Lower Darling Indigenous Nations (MLDRIN); Indigenous Water Policy Group) are also challenging the extent to which water policy and management recognise Indigenous water policy and management issues such as Indigenous rights to define and access commercial resource rights and so-called 'cultural flows'.

According to the NWI, Indigenous access is to be achieved through water planning processes that:

Chapter 1 include Indigenous representation in water planning, wherever possible;

Chapter 2 incorporate Indigenous social, spiritual and customary objectives and strategies for achieving these objectives, wherever they can be developed;

Chapter 3 take account of the possible existence of native title rights to water in the catchment or aquifer area;

Chapter 4 potentially allocate water to native title holders; and

Chapter 5 account for any water allocated to native title holders for traditional cultural purposes (clauses 52–54).

Three other clauses relate specifically to Indigenous interests.

- a. water plans are to provide a statutory basis for 'environmental and other public benefit outcomes' and these 'public benefit outcomes' include 'Indigenous and cultural values' (cl. 25 and schedule B (ii)).
- b. schedule E to the Agreement provides guidance for the preparation of water plans, including a requirement for plans to describe the 'uses and users of the water including consideration of Indigenous water use'.
- c. protection of certain Indigenous heritage values is included as a principle to guide the establishment of water trading rules (Schedule E). According to these principles, restrictions on extraction, diversion or use of water resulting from a trade can be made to manage, inter alia, 'features of major indigenous, cultural heritage or spiritual significance' (cl. 3(v)).

The NWI is of further relevance to Indigenous people in the emphasis it places on knowledge as the basis for sound decision-making. The NWI expects that water allocation decisions will rely on the best available knowledge, including Indigenous knowledge, science and contributions from other stakeholders.

Recent national reviews of Indigenous access to water confirm that while governments across Australia express strong interest in improving their water policies and practices, Australian governments are still at the early stages of formally recognising Indigenous peoples' relationships with water for spiritual, cultural and economic purposes (27; 29). The NWC's 2008 review of progress in water reform noted that one of the ongoing challenges is to improve water plans to incorporate Indigenous issues more effectively (44).

3. INDIGENOUS WATER VALUES AND GOVERNANCE

A greater general awareness of Indigenous concepts of country, the nature and extent of Indigenous interests in water and their relationship to other Indigenous values, is an important prerequisite to meeting Indigenous water needs. As the NWI and its associated institutions are rolled-out, they will encounter the rich and complex Indigenous institutions of ownership and management which are integral to the cultural landscapes shaped by local belief systems and religious cosmologies (26, 27).

It is important to emphasise that an exclusive focus on water use and management is antithetical to the holistic quality of Indigenous environmental perceptions and discourse that consistently emphasise connectivity and relationships between features and components of the socio-ecological system (69, 70, 75). During the past fifteen years accounts of Indigenous environmental philosophy, cosmology, land tenure systems and management practice have contributed to the academic and policy knowledge base to improve collaborations and engagement between different knowledge and value systems (54, 71, 73). Notwithstanding these contributions, a lack of awareness of Indigenous interests within NRM agencies still remains a serious 'capacity-building' challenge (21).

3.1 Water is embedded in Indigenous knowledge and governance systems

From this small albeit growing body of work several key features of Indigenous environmental governance can be identified that affect Indigenous participation in water resource planning and decision-making (e.g.44, 46, 47). Indigenous environmental governance:

- reflects the broader Indigenous claims for autonomy to guide and control their own fate;
- is often organised at local scale, ie catchments can often contain more than one autonomous Indigenous group but engages in technologies and partnerships at larger scales;
- is expressed in land and native title claims to reclaim control of traditional estates and natural resources;
- entails Indigenous law and decision-making rules and norms that affects rights and responsibilities to make decisions, access resources, and benefit from their use;
- is underpinned by knowledge encoded in languages, customs and practices. This includes ecological knowledge ('TEK'), values, beliefs, ethics and practices that govern Indigenous-environment relationships;
- encompasses holistic elements often captured as 'Country' - a term often used when referring to a physical or metaphysical place of origin for members of an indigenous clam, kin-based group, or loose community. It includes the values, places resources stories myths and cultural obligations associated with a geographical area including land and sea and freshwater;
- governs Indigenous interests and practices customary economies and practices.
- has been influenced by and interacts with Australian and Territory/ State policy and legal systems (e.g variable degree of control over the use, access and responsibilities for traditional estates, influence on TEK, etc).

3.2 Water forms an integral part of Indigenous cultural landscapes and economies

Some jurisdictions (e.g. Queensland and Western Australia) have commissioned studies of Indigenous values and knowledge to inform water planning. Notable examples include Yu's work with the Karajarri who hold native title rights and interests in the Kimberley's La Grange basin groundwater (75) and the Indigenous background reports for the Barron and Georgina Water Resource Plans in north Queensland. A series of Indigenous hydrological knowledge surveys was undertaken in the NT in conjunction with hydrological studies (e.g. 76). However, Indigenous knowledge remains under-utilised in water resource assessments, especially environmental flows research.

In many studies, Indigenous water values is examined as a feature of the Indigenous cultural landscape with significant attention devoted to the symbolic dimension of individual and group attachment to water. Northern studies describe and interpret stories relating to water represented in myth, painting, film, and dance, and the local customary practices, beliefs and ideas associated with water (e.g 68). All studies observe that groups conceptualise water sources and rivers, as with the land, as having derived from the actions of mythic beings during the Dreaming, when the world attained its present shape and the socio-cultural institutions governing water use were formed (36, 42). In contexts where resources or places are under pressure there may be a tendency to focus on key places or sacred sites as people strive to retain their traditions. However, affiliations to water

are much broader than those encompassed by the conventional cultural heritage paradigm: these humanitarian values relate to notions of sociality, sacredness, identity and life-giving (e.g. 20, 28, 29).

Many commentators refer to water's economic significance as a vital element underpinning the Indigenous harvest and intra-community distribution of aquatic life (e.g. 2, 4, 70). Historically Indigenous interventions improved rates of harvest of certain species, for example, river flows were manipulated with the construction of fish traps, weirs and small dams in numerous Australian river systems (e.g. 28, 42).

3.3 Congruence and conflict exists between Indigenous and other water values

The recent review of research and activities related to values, beliefs and practices of water across Northern Australia highlighted many issues and places where there is congruence between Indigenous and non-Indigenous values (28, 57). This highlights the need to understand better what processes are most influential in the formation and development of cultural meanings and environmental perspectives, and may provide an opportunity to build cross-cultural consensus around shared concepts, such as human-water interdependence, as well as more collaborative approaches to water management.

Yet a conflict between Indigenous and non-Indigenous people over basic values is also apparent. There is a tendency for Indigenous people to emphasise the cultural associations with and importance of water as a counterpoint to the resource value-orientation often expressed by non-Indigenous people or stakeholder groups.

4. INDIGENOUS RIGHTS AND INTERESTS IN WATER GOVERNANCE AND MANAGEMENT IN AUSTRALIA

4.1 Water planning and allocation

As Tan's review highlights, all States and Territories have developed, or are in the process of developing, surface and ground water management plans for areas of critical concern (e.g. in areas that are over-allocated) (65). When signing the NWI, all governments agreed to follow a nationally consistent approach to water planning. With respect to the process of preparing water plans, the jurisdictions are committed to:

- Consultation and community involvement, including Indigenous engagement (cl. 52, 95), and
- Actively considering and settling the trade-offs between competing outcomes for water systems, using the best available science, social and economic analysis and community input, and addressing impacts on affected entitlement holders and communities (cl. 36, 97) (18).

Current approaches vary significantly from jurisdiction to jurisdiction because of state legislation, policy and practice developed well in advance of the NWI (18). Attempts to compare water plans and their effect on Indigenous interests need to recognise the basis for these differences (67). In its most recent report to the Council of Australian Governments, the NWC found that while there had been

good progress in implementing agreed water planning processes, the roll-out of completed water plans had been slow (44). They further note that:

Delays have occurred due to the need for adequate consultation, insufficient time to source the required science, and resource constraints. No jurisdiction can yet claim to have a fully effective water planning system.

4.2 Delivery of domestic water supplies to Indigenous communities

Access to safe and affordable water is central to enhancing both human well-being and to securing sustainable livelihoods. In Australia, particularly its remote regions, water supply is a fundamental environmental health issue for many Indigenous communities (19). Indigenous people comprised approximately 25% of the population of the tropical north (including the Pilbara) in 2006, representing around a quarter of Australia's Indigenous population. About 87,000 Indigenous people live in 665 settlements varying from less than 50 people to 3,500 people. The remote and varying climatic conditions facing most Indigenous communities in north Australia provide challenges for water service providers. Communities are sparsely distributed, around 0.1 people per square kilometre and relatively small.

The prevalence of water-related diseases amongst the metropolitan Australian population is low, in contrast to that experienced by a majority of Indigenous Australians living in smaller urban, rural and remote population centres (19). Indigenous health is poor across the whole lifespan. Low birth weight, higher peri-natal mortality, higher rates of injuries, suicides, and chronic non-communicable disease all contribute to a life expectancy that is 20 years less than the national average (5). In remote locations, widespread poverty is exacerbated by substandard housing, inadequate water and lack of sanitation. Poor sanitation and water supply contribute to a higher incidence of many diseases, including diarrhoeal disease, acute respiratory infection, skin infection, and Hepatitis B.

Beard (3) cites national statistics on water service delivery, noting that the problem is particularly acute in remote regions:

Currently, more than half the population of discrete Indigenous settlements (44,563 people or ten per cent of the total Australian Aboriginal population) are affected by unreliable water supplies and 30 per cent by inadequate sanitation (ABS 2007b:29,31). Last year, this affected 92,960 Aboriginal and Torres Strait Islander people, three quarters (69,253 people) of whom live in very remote locations (ABS 2007b:17).

The concept of water poverty may be usefully applied to assess the status of water to many Indigenous communities. Researchers have been examining the relationships between poverty and water in many developing country contexts, particularly since the inception of the Millennium Development Goals (64). In Australia, these relationships have not been well explicated. The need to examine these relationships in north Australia is highlighted by the significant numbers of Indigenous people still not properly provided for by water services. This is evidence of a policy failure not widely recognised in debates about Australian water policy. The lack of infrastructure and poor quality of services was highlighted more than ten years ago by Henderson and Wade (19) and by the then Federal Race Discrimination Commissioner in 1994.

There are a number of knowledge gaps relevant to reforms to the water supply or service delivery sector. Little is known about Indigenous attitudes towards water conservation, efficiency or methods

of cost-recovery in the context of domestic water supplies (74). Altman and Branchut's study of water governance in Maningrida identifies a number of small enterprises that are reliant on reticulated town water and queries the implications of water pricing for these enterprises (2).

A substantial report on water use and supply in Aboriginal communities of South Australia recently confirmed that any change in the provision of water to Aboriginal communities needs to take account of the 'strong relationship between traditional knowledge and practices in water management and contemporary usage' (74). This report cites inconsistencies between the COAG water reform agenda and innovative research on 'bi-cultural' water management frameworks that 'integrate traditional understandings of water usage with water infrastructure and public and household hardware' (74). The inconsistency, the authors argue, arises from the separation of service provision from water resources management and regulation:

in terms of Aboriginal understandings of water, it is perhaps more appropriate to consider managing water as involving both service delivery and more broader catchment management processes involving both lands and waters (p. 15).

The Northern Territory's Power and Water Corporation appears to be responding to the need identified above. The Corporation provides electricity, water and sanitation services to 72 Indigenous communities and 7 outstations throughout the NT. The agency has a drinking water quality policy that commits it to meeting drinking water quality guidelines, monitoring drinking water, including a contingency and incident reporting system (51). The NT has a Water for Healthy Communities Strategy which aims to provide safe, reliable and sustainable water supplies. It is implemented through the development of Community Water Plans. It is notable that the rationale for the community water planning is to plan for the range of water needs of community, 'rather than the drinking water supply in isolation' (51). This is expected to result in a more accurate picture of water service needs:

A broader understanding may be gained of the risk as to the ability to supply an adequate quantity of water sustainably into the future and should ultimately open up opportunities for evaluating alternative sources, potentially reducing pressure on (and therefore risk to) the reliability of the potable supply (p. 29).

5. BARRIERS TO INDIGENOUS PARTICIPATION IN WATER DECISION-MAKING AND RESOURCES

Indigenous Australians face a range of water related challenges as they seek to engage in water reforms and emerging water institutions and mechanisms such as water planning. In summary key barriers include:

1. Challenges to enable Indigenous governance, including modes of decision-making, representation, communication and accountability, to inform water governance structures and processes.
2. Poor understanding of Indigenous cosmology, environmental philosophies and resource management institutions amongst the dominant settler society;
3. Difficulties facing Indigenous representatives wishing to participate in multi-stakeholder resource management groups, such as catchment management authorities, which in some

jurisdictions are responsible for water planning. Issues include:

- power imbalances restrict equitable Indigenous participation in many decentralised and democratic decision-making process;
 - The challenges to align scales of Indigenous knowledge and governance systems with local, regional and policy-levels and scales of planning and decision-making
 - Incompatibility between Indigenous knowledge and aspirations for holistic management and scientific knowledge and technical forms of rationality
4. Narrow interpretations of Indigenous water property rights and governance in water planning and decision-making. Issues include:
- lack of specification of Indigenous water requirements in water resource assessments and water allocation plans.
 - The need to distinguish between the roles of Traditional Owners and other members of the Indigenous community.
 - poor formal recognition of the right of Indigenous groups to participate in management of waters.
 - Strong perception amongst water management authorities that Indigenous access to water should be for non-commercial purposes.
5. Lack of institutional capacity in Indigenous communities and water resource agencies to address cross-cultural issues and full range of technical issues underpinning water planning. Key issues to address include:
- the lack of evaluation of performance of catchment management authorities in respect of obligations to Indigenous people
 - The existence of Indigenous protocols for representation and participation, as well as guidelines for engagement of Indigenous people in planning (Sources: 21, 27, 32, 46, 54)

Jackson and Altman (26) argue that there are two significant consequences arising from this inadequate policy framework. Firstly, Indigenous groups who are unable to frame and specify their requirements are at a distinct disadvantage when competing with organised groups with clearly articulated claims for water and recognised expectations for continuity of access and use. This positional disadvantage is particularly pronounced in situations of water scarcity and intense competition between users. The omission of Indigenous values and uses may result in inefficient and inequitable allocation decisions, and regional development opportunities may be foregone (8).

Secondly, if Indigenous people are excluded from water planning they will be unable to contribute their hydrological and ecological expertise to water management. Effective water resource management must be grounded in the best available knowledge yet in many parts of Australia the science base is limited. As such, the considerable knowledge base that exists within many Indigenous communities regarding local water systems represents a valuable resource for policy-makers. To exclude Indigenous participation may therefore not only be to the detriment of the interests of Indigenous stakeholders but may also substantially limit the effectiveness of water management generally.

5.1 Support for Indigenous environmental governance in water planning and decision-making

Indigenous systems of customary law dictate that traditional land-owners have a substantive role in land and water management and resource regulation, and hence, a particular interest in environmental governance structures (46). Recent studies observe that Indigenous expectations of the extent to which they can directly participate in water management institutions are not being met (e.g. 4, 9, 28).

It is common to see agencies rely on Indigenous representatives of water allocation committees for Indigenous engagement and values assessment. There are numerous problems associated with this representative model of consultation, including the basis for selection and the absence of rigorous evaluation in plan review and monitoring processes. For instance, it is difficult for Indigenous representatives to fulfil their responsibilities to other group members, particularly amongst widely dispersed populations, in the absence of adequate support. The technical and legal complexity of many of the hydrological issues addressed by advisory groups may also inhibit effective participation.

Indigenous participation in a range of environmental management sectors has previously been described and barriers analysed (e.g. 31-33). Attempts have been made to assess the level and nature of participation, although independent assessments of participatory natural resource management programmes are not widespread. Notably few empirical studies have evaluated the effect of growing numbers of Indigenous reference groups supporting regional NRM bodies, or the quality of Indigenous participation in multi-stakeholder catchment groups (21, 33).

5.2 Narrow interpretations of Indigenous water property rights and governance

NWI implementation emphasis is squarely placed on protecting Indigenous customary values (which are construed as non-market values) and meeting legal requirements to protect native title (27). The NWI actions reflect statutory frameworks for native title and interpretations of Indigenous resource interests that are, by numerous accounts, 'insufficiently inclusive in their definition of water property' (39). The property rights conferred by the Native Title Act 1993 are only partial, covering customary use rights. Furthermore, the wording in the NWI, where water allocated to native holders for traditional cultural purposes is to be accounted for (paragraph 54; emphasis added), suggests an intention to preclude commercial uses under the definition of native title rights, although the absence of definition leaves some doubt as to what is intended. In light of Australian government commitments to overcome Indigenous disadvantage, it is significant that no explicit obligation is placed on the parties to utilise this market-based policy framework to advance Indigenous people's economic standing.

Jackson and Altman (26) describe the treatment of water rights under the native title regime:

Aside from the property rights granted to Indigenous people under land rights regimes, the Mabo decision and the Native Title Act made possible some recognition of Indigenous rights to inland waters under Australian law. Under the Act, rights to hunt, gather and fish for the purposes of satisfying the personal, domestic or non-commercial needs of native title holders can be exercised free from licensing or permit restrictions that otherwise apply to such activities. The same exemption applies to cultural and spiritual activity and other kinds of activity which may be later prescribed, provided the activity involves the exercise or enjoyment of native title rights and interests.

The authors note that as at June 2008, there were 502 applications for native title, 112 registered native title determinations and 342 Indigenous land use agreements under the Native Title Act. According to McFarlane (41), most if not all water resources (groundwater and surface water) within the Australian mainland are subject to native title claims.

Indigenous rights and interests were not, however, formally considered in water policy documents prepared during the initial water reform era of the 1990s. Poh Ling Tan argues that this is surprising given that Native American water rights in the USA have been the subject of much attention. Crown ownership of water was affirmed during this initial period of water reform, and all States and Territories subsequently passed complementary legislation to give effect to s 212(1)(b) of the Native Title Act, which confirmed 'any existing right of the Crown in that capacity to use, control and regulate the flow of water'.

As the Crown has the right to use, control and regulate the flow of water, it is likely that any utilisation of native title to water resources (apart from the domestic and minor uses statutorily exempted from regulation) would be considerably controlled by the regulatory regime in the States and Territories. Jackson, Tan and Altman (2009) argue that the interpretation of the NWI' Indigenous access provisions should be more purposive – not only in regard to Indigenous access to water areas and resources but also to inform reforms to enable Indigenous water issues to be incorporated into planning protocols and processes

Implications for water resource use allocations and decision-making

Despite the existence of the NWI guidelines for plans to immediately include consideration of Indigenous water use, Australian water plans rarely specifically address Indigenous requirements. The NWI envisages a situation in which water may need to be allocated to meet certain Indigenous requirements: Indigenous use, landscape features of value and native title. There are substantial conceptual and technical difficulties facing water resource managers seeking to calculate and allocate water to meet these needs. Space limitations demand that we refer only briefly to this existing knowledge gap. There have been a few attempts to identify an Indigenous share in an allocation process, and some preliminary consideration has been given to defining the problem from an Indigenous perspective and critically examining the culture of water administration (23, 72). This work reveals the need for greater clarity in conceptualising the nature of Indigenous water uses or needs, as well as techniques for elucidating the relationship between flow and values and specifying Indigenous water requirements. Experience in the USA where tribal water rights have been adjudicated, quantified and, in some cases codified, will be instructive (see discussion below).

Plans in many jurisdictions implicitly assume that environmental flows will serve as a surrogate for a mechanism to meet Indigenous social, cultural or spiritual requirements, if these are considered at all. In unregulated or unallocated systems, 'non-consumptive' uses are protected by limits on water extraction, rather than by an entitlement (e.g. Draft Katherine Tindal Aquifer Water Allocation Plan, Draft La Grange Water Allocation Plan). There is a risk that in systems where there is high competition for water, the lack of definition of non-consumptive uses may result in negative environmental impacts and impairment of Indigenous values. Indigenous groups participating in environmental water allocation processes in the Murray Darling Basin have argued that the criteria for determining environmental flows are too narrow and reflect the priorities of the non-Indigenous public or ecologists.

Participants at the first national Indigenous Water Planning Forum expressed interest in testing to what extent Indigenous water requirements can be quantified, whether environmental flows are sufficient in meeting Indigenous social, spiritual and customary objectives, and if not, is it extra or

'different' water that is required, and further, under what mechanisms can Indigenous groups gain greater management control of these redefined flows (30). Only Queensland and New South Wales legislation provides for special mechanisms to deliver an Indigenous share of water, for cultural, social or economic purposes (30, 67). In these cases where legislative provisions have been developed the criteria used by water resource makers to ensure allocations are adequate, equitable and transparent are not well developed. The current mechanisms for specific purpose water licences (NSW) and Indigenous reservations (Queensland) do not appear to be popular with Indigenous groups as yet, although in the latter case, the reservations have only recently been introduced and has not been widely publicised. Research is being carried out as how best to allocate water to achieve social and economic aspirations of Cape York Indigenous communities (67). Implementation of the special measures in those jurisdictions reveals the need for greater clarity in conceptualising the types of Indigenous water uses or needs, and evaluation of their effectiveness, transparency and suitability. Indigenous input will be crucial to these tasks.

The potential economic benefit to Indigenous people that might be realised from rights to water is also not well understood. A preliminary study attempted to document for the first time actual allocations of water licences and entitlements to identified Indigenous users on a State-by-State jurisdictional basis. The allocations investigated were to Indigenous businesses for commercial purposes and not for customary (non-market) purposes that can also have a significant impact on people's livelihoods (see 2). Specific information on the Indigenous use of water for commercial or any other purposes is also not held by any Indigenous bodies surveyed. Furthermore, no State or Territory has an administrative identifier in their databases for water, i.e. there is no standard facility for identifying Indigenous licensees in jurisdictional databases. This finding is relevant to the NWI requirement to account for water allocated to Indigenous purposes, albeit non-commercial purposes.

The issue of using Indigenous identifiers in administrative databases has a long and complex history. An identifier would be essential for providing a baseline benchmark for future evaluations of new policy initiatives to encourage greater Indigenous participation in the water economy. However, the use of such an identifier in administrative water allocation data sets could also be considered invasive (30). The merits of an Indigenous water register require further consultation and consideration.

Access to land has been a mechanism used by Traditional Owners to manage development. For example, the grant of water licenses on Aboriginal land in the NT requires consent of traditional owner's. An example can be drawn from the Daly River region where Malak Malak traditional owners permit and charge a mango farmer to extract water from the river. Access to Aboriginal land is required for the pipe that lies on the river bed and traverses the banks owned by the Malak Malak.

5.3 Under-developed institutional capacity and arrangements

Although the NWI provides a foundation to engage with Indigenous people and meet their diverse water requirements, the institutions to guarantee outcomes of a high standard and positive effect are poorly developed. There is a lack of consistent definitions, standards, effective mechanisms, skills and know-how, agency leadership, community networks, and rigorous performance evaluation and monitoring. There is also an inadequate information-base upon which to evaluate NWI implementation, including an absence of empirical evidence of the impact of various water reforms on rates of Indigenous participation in either economic or environmental water-based activity.

The NWI requires that water plans incorporate Indigenous social, spiritual and customary objectives and strategies for achieving these objectives. Little guidance is provided to water resource managers

and regional bodies seeking to meet the objectives relating to Indigenous access and involvement. Methods for determining Indigenous specific allocations lack consistency and transparent rationale.

The monitoring provisions (cl. 104) of the NWI require that the Natural Resource Management Ministerial Council, in consultation with the NWC, develop a comprehensive national set of performance indicators for the NWI. Significantly, no jurisdiction has developed performance indicators to evaluate implementation of its Indigenous access outcomes. Despite the requirement of the NWI to account for any water allocated to native title holders (cl 54), the current accounting framework does not provide for the registration of such allocations or others made to Indigenous people or corporations. It is therefore difficult to obtain a reliable account of Indigenous-specific water allocations, their volumes and conditions of use. Reporting under the NWI is too general for independent evaluation of its implementation. For example, the Implementation Plans do not provide sufficient information on State and Territory strategies to incorporate Indigenous social, spiritual and customary objectives.

6. POTENTIAL TO IMPROVE INDIGENOUS PARTICIPATION IN WATER PLANNING AND MANAGEMENT

There are a number of legal, policy and planning mechanisms that could be adjusted, reformed or integrated into water planning decision-making and management to improve Indigenous participation about the ways water is allocated, used and managed. Key areas of potential to support Indigenous water governance and management include:

Through legal and regulatory frameworks (such as Native Title claims and ILUAs) that can establish formal co-management agreements

1. Through introduction or reform of national mechanisms used to deliver Indigenous commercial water allocation.
2. Through the establishment of Indigenous Water Trusts or Reserve Allocations to provide an increased level of Aboriginal participation in the water market and to assist water related enterprises.
3. Through an integrated approach to water planning and management that supports Indigenous participation in water quality and allocation decision-making and establishes cross-cultural collaborative arrangements and processes.

6.1 Formal co-management agreements (including Indigenous Land Use Agreements)

Amendments to the *Native Title Act* in 1998 introduced Indigenous Land Use Agreements (ILUAs). These are agreements between a native title group and an interested party(ies) in the use and management of lands or waters. ILUAs cover a wide array of topics and may be used as part of the negotiations leading to a consent determination of native title, as occurred in the case of the Pine Hill ILUA at Ti Tree (NT), thus providing a flexible means of reaching agreement on the manner in which future acts can proceed (4). They can be negotiated in areas where native title has, or has not yet, been determined to exist. When registered with the National Native Title Tribunal, ILUAs bind all parties to the terms of the agreement.

The Native Title Act contains a range of agreement-making options, including three types of indigenous land use agreements (ILUAs). As of May 2009, the NNTT had registered 369 ILUA's nationally, including 200 in Queensland, 92 in the NT, and 12 in Western Australia. These three states accounted for 92% of ILUAs. Many commentators have advocated negotiated agreements as a means of satisfying the range of co-existing interests in resource (including water) management, (9, 67). Negotiations are based on established rights and/or legislatures, including instances where a hierarchy of rights is established. Smith (61) and Langton and Palmer (37) discuss the opportunities and challenges provided by an agreement-making mechanism of the Native Title Act 1993, the Indigenous Land Use Agreement. As the example outlined in the box below, such agreements can apply to water. Behrendt and Thompson (4) identify a number of important advantages:

- (i) solutions can be generated through respectful and consensual processes in contrast to the potential for unsatisfactory resolution through the courts. These outcomes can form a valuable foundation for on-going relationships that are capable of constructively addressing emergent issues.
- (ii) Indigenous parties must consent
- (iii) It allows agreement without the prerequisite that native title be recognised, or even addressed
- (iv) It provides sufficient flexibility to allow for resolution of issues on a regional or state basis, making it amenable to addressing issues specific to a region.

Negotiating water governance through ILUAs – the Ti Tree example

An Indigenous Land Use Agreement (ILUA) on the Pine Hill pastoral lease in central Australia was negotiated in 2007, following a development application to grow grapes. Amendments to the Native Title Act in 1998 introduced Indigenous Land Use Agreements (ILUAs). These are agreements between a native title group and interested parties in the use and management of lands or waters. They can be negotiated in areas where native title has, or has not yet, been determined to exist. When registered with the National Native Title Tribunal, ILUAs bind all parties to the terms of the agreement. As of May 2009, the NNTT had registered 369 ILUA's nationally.

The Northern Territory Government purchased the Pine Hill lease in 2000 to secure horticultural development and subsequently negotiated with the traditional owners. The Indigenous Land Use Agreement gave the traditional owners compensation in the form of a living area on the Pine Hill pastoral lease, an art centre at Mulga Bore and a horticulture block to develop. In return native title was extinguished on two other blocks on the lease where NTG wanted to develop. Native title was recognised over the remainder of the area. According to the Central Land Council, since the ILUA was settled, a water licence has been granted to traditional land owners to develop horticultural enterprises.

In a submission to the 2004 National Water Initiative Discussion Paper, the NSW Aboriginal Land Council and NSW Native title Services Ltd recommended that

Perpetual licence conversions only be permitted where there is an Indigenous Land Use Agreement which properly reflects the interests of Aboriginal people and which clearly identifies the extent of any compensation if any (19 April 2004).

Behrendt and Thompson (4) find from their survey of the NSW experience that the ILUA procedures have been under-utilised, despite a mandate in the NSW legislation for water management to benefit Indigenous people. They argue that

... the government has instead preferred to push Aboriginal issues off to be dealt with at an undefined time in the future. In the few places where ILUAs have been used, they have not involved recognition of native title rights and interests (p. 84).

Indeed the NTA emphasises agreement making as the preferred method of resolving a wide range of native title issues. Langton et al (37) have conducted national overviews of regional agreements and general agreements respectively. This work should be more closely examined to gauge the suitability of agreements between water resource agencies, native title holders and other parties to further the implementation tasks of the NWI. The first principle noted by Edmunds suggests that they could offer a comprehensive framework for the resolution of key inter-related issues which would appeal to Indigenous groups who express interest in a suite of issues spanning the 'economic', 'environmental' and 'cultural' domains so often treated separately in resource management:

Agreements must establish a clear framework concerning heritage and site protection, as well as access to and use and management of land and resources, and must accommodate

the needs of Indigenous people as well as other interests (cited in Langton and Palmer (37) p. 14.

There is evidence that agreements are 'promoting the systematic involvement of Indigenous people in land and resource management and planning; and to develop greater indigenous control over economic and social matters, including service delivery' (in 37). Of direct relevance to the NWI intention to improve Indigenous participation in water management, is the expectation that agreements facilitate better 'post-agreement relations between Indigenous people and the wider community, than do judicial or arbitrated determinations'. Drawing on the Canadian experience, Robinson (53) shows how negotiation can be considerably more cost-effective than protected litigation and can provide improved approaches to catchment planning and management regimes.

Management tools developed in other policy contexts, such as marine park management, may offer insights into the resolution of native title claims and inform the development of mechanisms to meet other Indigenous socio-cultural requirements for water. The Great Barrier Reef Marine Park Authority, for example, has developed cooperative working arrangements with traditional owner groups in the form of traditional marine resource use agreements (TUMRAs). These agreements allow Indigenous people to undertake activities, such as dugong hunting and fishing, in accordance with local custom or tradition for the purposes of satisfying personal, domestic or communal needs (55). TUMRAs are a legal and scientifically valid document that describes how traditional owner groups wish to manage the traditional use of marine resource activities in their sea country. It is consistent with the *Native Title Act*, and therefore is familiar to native title parties, although it does not bind all Traditional Owners. Importantly the TUMRA process has been used by some Traditional Owners as an important stepping stone to their efforts in negotiating a suite of co-operative coastal and catchment management agreements (55).

There appear to be very few cases where water rights or resource management has been a central feature of an ILUA. The negotiators representing the Miriuwung-Gajerrong native title holders in the Ord region of the Kimberley argued for rights to a share of water required for farming in Ord Stage 2, as part of the settlement package. They were unsuccessful in generating a precedent of this kind (20). According to Ephrem Kennedy, the negotiated outcome included a role in joint management of national parks and a water reserve adjacent to Lake Argyle, as well,

Traditional owners were given intensive agriculture farmland and that comes with an allocation of water, giving Miriuwung and Gajerrong a say over management of water (cited in 28).

Notwithstanding the fact that native title determinations have so far not provided for a right to commercial use of water, the native title framework has been used, in at least one situation, to leverage Indigenous access to a benefit stream from water-dependent commercial land use. An Indigenous Land Use Agreement (ILUA) on the Pine Hill pastoral lease in central Australia was negotiated in 2007 following a development application to grow grapes (see above).

The Native Title Act also provides for regional agreements. Such instruments could be used to settle water rights claims and cooperative water planning arrangements across large areas involving multiple Indigenous groups and other parties. The ideas behind regional agreements have been discussed in Australia for the past fifteen years (see 46). Regional agreements can provide the resources, organisation and political experience to implement Indigenous rights through ongoing institutions and processes such as co-management boards. They have been popular in Canada as a means of redressing the alienation of Indigenous rights, negotiate the design of institutions that draw on Indigenous knowledge, initiative and expertise and mechanisms for Indigenous involvement in

decision-making, while accommodating the rights held by non-Indigenous people and the broader public interest in resource management (9, 53).

6.2 National mechanisms to deliver Indigenous commercial allocations

Many of the suggestions below are derived from the report on the outcomes and recommendations arising from the inaugural Indigenous water planning forum organised by the NWC in February this year (30).

- Consideration should be given to special measures to make allocations to Indigenous groups who require water to engage in enterprise development. Indigenous people require positive programs to leverage them into the water market.
- Consideration should be given to the establishment of a financially sustainable Indigenous Water Fund to underwrite the Indigenous purchase of allocation from existing consumptive pools where it is otherwise unavailable. In over allocated systems, equitable access might require government investments in buy-backs to redistribute entitlements.
- All water plans in unallocated systems should make available strategic Indigenous Reserves. The Reserves should be available for community development and commercial purposes.
- Mechanisms for allocating water to Indigenous communities for commercial purposes should be trialled and evaluated in a number of Australian jurisdictions.

There is a growing awareness amongst Indigenous leaders and government water managers that policy instruments need to be developed so that Indigenous people are not excluded from benefits of water resource development. In the some regions, where water use is increasing, but the resources are not yet fully developed, there is a need to ensure that water is reserved for Indigenous use to guarantee access in the future when markets are established. Jackson and Altman (26) have argued that without specific policy measures, there is a risk that Indigenous people may be excluded from economically valuable water resources.

Australia's history of relations with Indigenous people suggests that without a mechanism to redistribute rights to water, the National Water Initiative will fail to meet Indigenous expectations for equitable access to an important source of wealth in society and a critical basis for well-being.

6.3 Indigenous Water Trusts

The precedent to establish a Water Trust for Indigenous people in NSW offers useful approaches for consideration in Northern Australian contexts. In 2002, in response to the NSW Water Management Act's requirement that the management of State water resources benefits Aboriginal people, the Government agreed to a Water Trust of \$5 million. It aims to provide an increased level of Aboriginal participation in the water market and to assist water related enterprises. Funding can be provided to Aboriginal communities or individuals for water conservation, water-based infrastructure, water licence purchase, and preservation of Indigenous water knowledge.

According to Behrendt and Thompson (4), the Trust

... has the potential to represent an important mechanism by which the historical inequities in access to water resource can be remedied and represents a mechanism by which Aboriginal people will buy into water markets....It is essential that the focus of the Trust be to acquire interests in water (2004: 125).

They raise the significant concern that the Trust will have insufficient funds to make a difference:

Given that the former Department of Land and Water Conservation has been reported as saying that its best estimate of the value of the water market is in the vicinity of \$5 billion, the allocation of \$5 million over two years is not a significant proportion of that value... At the very least, funding for the trust needs to be substantially increased if it is to be of any real benefit to Aboriginal people (2004: 126).

Funding could be supplemented through other mechanisms, according to the NSW Aboriginal Land Council. Suggestions include a levy on the sale of water licences, or a tax on land (ibid). The original intention of the Land Council and NTS was that the Trust would eventually receive 5% of the total value of the tradeable water market. McAvoy (40) explains why this figure was selected:

5% was a figure raised at the time the Water Management Bill was being negotiated and it was considered politic to stay with that figure. What does 5% of the total tradeable water market equate to in dollar terms? The Department of Land and Water Conservation suggested earlier this year that its best estimate of the value of the market was \$5 billion, 5% of which is \$250 million...It is a fact that the NSW NTS was widely criticised in the Aboriginal community for selling out by putting forward this option. It was argued that the loss of leverage in terms of individual nations rights to self determine and negotiate their own deals outweighed whatever share of the \$250 million they may ever receive... The contrary argument was this: so long as the Government is going to continue the process of commodification of the water, the native title rights of any group will be reduced to a fight over how many dollars and who will pay. Unfortunately, the attitude of Government to the payment of compensation for native title is if they cannot sheet the cost home to some other party, then they will delay the entry of a judgement debt for as long as they can ... The final piece of the proposal and possibly the most attractive to government was the suggestion that water licenses held by the Trust or the dollar equivalent would be used as the first contribution to any compensation payable to a native title holder (2002: 95).

6.4 Integrated approach to water planning and management

As this report highlights, the articulation and negotiation of multiple values and types of knowledge as they relate to water planning and decision-making is fundamental to the National Water Initiative efforts to deal with the challenges to sustainably develop water systems and direct how valuable water resources are shared between competing users (NWI para. 36). Yet it is clear that limited planning arrangements and processes exist in Northern Australia to ensure the development of water resources proceeds in an ecologically, culturally and economically sustainable manner. In its 2008 report to the Council of Australian Governments on progress in water reform, the National Water Commission found that while some progress has been made to implement water planning processes, the negotiation, completion and delivery of water plans has been slow and costly.

As outlined above, the planning challenge is amplified in Northern Australia because ambiguity remains about water entitlements, mechanisms to regard Indigenous interests in water, and compliance with specific environmental management rules. This kind of complexity is regarded as problematic because it congests decision-making and increases zones of conflict and produces rigid rather adaptive planning processes and regimes (12, 35).

The achievement of integrated water planning and management that ensures multiple (particularly Indigenous) values are negotiated and recognised is a high water planning priority identified by the NWI. There has been considerable interest in existing decentralized governance arrangements (ie regional NRM) to achieve this goal (NWI 2008, 2). This realised on 'bottom-up' non-government planning groups and process to enable Indigenous and non-Indigenous groups to collaborate in policy development and implementation, to co-ordinate local, state and federal government policies and activities; and negotiate multiple social and cultural values related to environmental planning decisions (e.g. 31, 57).

Recent work commissioned by the North Australia Water Futures Assessment has highlighted the plethora of projects that have provided local albeit patchy assessments of the many social, cultural values, beliefs of practices that exist along Northern Australian rivers (57). This review also highlighted that limited work has been done to compare the efficacy of different decentralized planning models to:

1. provide mechanisms for Indigenous and other groups to negotiate cultural, economic and environmental values, beliefs and knowledge associated with water in an effort to inform the sustainable targets for northern Australia's water resources
2. assess what type or mix of integrated planning approaches constitutes an effective system of water governance in Northern Australia

As Jackson et al (30) argue any effort to ensure integrated planning objectives and management activities meet the needs and aspirations of Indigenous communities needs to be cognisant that

- Indigenous people contribute to environmental water management. Many Indigenous groups perform valuable environmental services, particularly in regions where they have direct management control of their land holdings. The biodiversity values of these land holdings can be high and this value may be reflected in protected area declarations or other forms of off-reserve conservation management (e.g. Indigenous Protected Areas).
- Public benefits are being derived from Indigenous management and these benefits remain largely unrecognised and ignored, despite the potential private and public benefit. Recognition of the Indigenous Caring for Country model took over a decade to garner adequate support from the Commonwealth with the establishment of the Working on Country program in 2007. Every effort should be made to apply this experience to the water context and ensure rapid gains.

Diverse types of decentralised planning structures and processes have been established that could be used to support such Indigenous integrated water planning objectives. These include community-based natural resource management (NRM) activities; regional NRM programs; co-management agreements and support through policy-level Indigenous collaboratives. These models are described below, with key attributes summarised and compared in Table 1.

Community-based NRM

Examples of community-based NRM (CB-NRM) initiatives that are occurring in Northern Australian context include Land and Sea and other Ranger Groups and programs. These groups have been established in diverse ways ranging from formal incorporated groups to a few leaders taking collective action to solve a particular resource management problem (52). CB-NRM arrangements and activities entail local, place-based projects. These projects usually involve diverse participants, particularly scientists, Indigenous elders and rangers, and government representatives who assist Indigenous communities in their efforts to set and implement planning priorities. The heavy emphasis on local scale and place-based efforts of these initiatives and the recognition of local and Traditional Ecological Knowledge to inform local-level decision-making has resulted in CB-NRM gaining significant support from Indigenous communities (21, 54).

Regional NRM

A key trend in efforts to apply environmental governance through decentralisation is to design planning structures and processes of civic engagement at the regional scale (35). Benefits are seen to include the avoidance of local parochialism that frustrate CB-NRM efforts, improving power sharing and negotiation amongst multiple government and non-government stakeholders, and the incorporation of diverse types of knowledge that enhance a strategic approach to the management of natural ecosystems and resources.

While the regional model of environmental management has been widely advocated, key challenges and problems for ensuring this planning model achieves equitable and sustainable outcomes have been raised (33, 35, 56). Specific requirements and resources are delegated to enhance Indigenous participation in natural resource decision-making and management. Unequal dynamics, low (Indigenous and non-Indigenous) institutional capacity to engage in productive and appropriate deliberation, and enduring social, cultural and economic barriers has meant that levels of Indigenous participation in many NRM regions remains low (21).

Indigenous co-management

Co-operative management ('co-management') describes a formal agreement between Indigenous groups and the State that empower Indigenous groups to make joint decisions over legally recognised Indigenous resources or lands. In Northern Australia these are often achieved through legal claim negotiations (e.g. land claim or native title claim) or as part of international and national policy initiative (e.g. the Indigenous Protected Area initiative). Examples of Indigenous co-management for protected areas that have been established as part of a land claim or native title claim agreement include Kakadu National Park (NT) and Mirriuwung-Gajerrong (WA) (20, 42, 52).

Policy-level Indigenous collaboratives

Much of what is known about groups established to facilitate collaboration is drawn from consensus-building efforts focused on local, action-level activities. Yet collaborative groups are also being established to address large regions and policy-level conflicts (34, 58). Little is known about how policy-level collaboratives differ from the community-based efforts that dominate the literature, and even less is known about what makes policy-level collaboratives 'work' for Indigenous policy issues. Yet collaborative groups have been established across Northern Australia to enable Indigenous

people to address large regions and policy-level NRM issues. The focus of these arrangements is not on-ground activities but instead concentrate on influencing policy development and research goals and practices. Examples include the North Australia Indigenous Land and Sea Management Alliance (NAILSMA) Indigenous Water Policy Group and the Indigenous Ministerial Environment Group.

Each decentralised environmental planning model is summarised with specific examples in Table 1. This Table highlights the different purpose of each integrated planning approach; the scale and decision-making level context at which each planning model operates; the level of Indigenous decision-making (including property rights); and the capacity issues that affect the efficacy of Indigenous participation in each planning mode.

Table 1: Different decentralised planning approaches available to support Indigenous integrated water planning objectives

	Community-based NRM	Regional NRM	Co-management	Policy-level Indigenous Collaborative
Purpose	<p>Managing specific threats, areas and species (e.g. Aboriginal Land and Sea Rangers, Ghost Nets Program)</p> <p>Harvesting patrol & regulation (e.g co-operative wildlife harvesting agreements, Cape York)</p> <p>Community Education, knowledge transfer (eg Elder training rangers)</p> <p>Access to country and stewardship responsibilities (e.g Dhimurru Aboriginal Corporation management activities in recreation areas).</p>	<p>To inform and support Indigenous activities under regional NRM targets and programs (Indigenous group of Nthn Gulf Regional NRM Board, Qld)</p> <p>To inform and support catchment management planning (Daly River Management Advisory Committee)</p> <p>To inform and support water sharing and allocation planning (Katherine Water Advisory Committee)</p>	<p>Biodiversity conservation and tourism management for Indigenous lands (e.g Kakadu National Park)</p>	<p>Inform policy-level decision-making (e.g NAILSMA; Cape York Institute)</p> <p>Strategic support for regional Indigenous land and water planning & management activities.</p> <p>Facilitates cross-regional networks (e.g Indigenous water facilitators)</p>
Decision-making scale /level	<p>Local, site, place. Can be organised by language group(s), Aboriginal Corporation or through Local Government</p>	<p>Regional or catchment scale; or Administrative planning unit (e.g Caring for Our Country region)</p>	<p>Defined by Indigenous claim or tenure arrangements.</p>	<p>Cross-regional, cross-jurisdictions</p>
Decision-making control	<p>High, local decision-making autonomy.</p> <p>Predominately on Indigenous land</p>	<p>Medium-low strategic decision-making autonomy</p> <p>Mixed tenures</p>	<p>Medium-high decision-making autonomy.</p> <p>Long-term lease conditions underpin agreements.</p>	<p>Medium-high decision-making for some NRM issues (e.g Carbon trading policy)</p>

	Community-based NRM	Regional NRM	Co-management	Policy-level Indigenous Collaborative
Capacity	<p>Affected by fluctuating program objectives and fragile, short-term, inadequate funding resources. This is starting to be addressed through Working on Country Program</p> <p>Appears to have positive impacts on Indigenous health benefits and well-being</p> <p>Reliant on strong Indigenous environmental governance systems, including TEK</p> <p>Highly dependent on ability and capabilities of local brokers</p>	<p>Requires appropriate resources (e.g from C4OC program).</p> <p>Single Board representatives struggle to broker multiple Indigenous group priorities and aspirations.</p> <p>Group dynamics can adversely affect Indigenous participation in NRM decisions</p>	<p>Tensions can exist between the priority given to global conservation values vs local Indigenous values</p> <p>Planning and management processes can frustrate Indigenous participation (e.g Indigenous authority & expertise not recognised in executive pay structures)</p>	<p>Well resourced.</p> <p>Fulfils a brokering for a range of strategic Northern Australia NRM and research needs.</p> <p>Strong partnerships with government and research organisations important factor in brokering capabilities</p> <p>Challenges exist to coordinate local, regional and cross-regional Indigenous representative group responsibilities and priorities</p>

Sources: 28, 31,32, 52, 57.

7. SUMMARY

This chapter outlines key issues affecting support for Indigenous governance and management regime in water resource rights and decision-making. Indigenous environmental governance is described as a system of decision-making rules and management responsibilities that are negotiated at the local scale, underpinned by knowledge encoded in Indigenous languages, values and practices, and embedded in broader systems of Indigenous law and autonomy.

We outline the key policy, legal and planning constraints that restrict Indigenous interest and rights in water governance and management which include the lack of political and community understanding about Indigenous water rights, values and management responsibilities; difficulties faced with appropriate representation in water planning and decision-making; technical difficulties in quantifying Indigenous water requirements; inadequate support to guide, monitor and evaluate Indigenous participation in water resource planning and management; and low capacity for collaboration within the Indigenous sector and water planning agencies.

Potential avenues to improve Indigenous participation in water governance and management are also identified. This includes highlighting the need for legal and policy reforms to clarify native title holders' water entitlements and decision-making authority. This impasse could also be partially overcome through the achievement of integrated water planning arrangements and collaborative processes that empower effective and appropriate Indigenous participation in water planning decisions.

8. REFERENCES

1. J. Altman, *Dialogue* 23, 29–43 (2004).
2. J.C. Altman, V. Branchut, *Working Paper No. 46/2008*. Canberra, Centre for Aboriginal Economic Policy Research, the Australian National University (2008).
3. N. Beard, *Research Report No. 49*. Adelaide, CRC for Water Quality and Treatment (2009).
4. J. Behrendt, P. Thompson, *Journal of Indigenous Policy* 3: 37–140 (2004).
5. C. Burgess, F. Johnston, et al., *Australian and New Zealand Journal of Public Health* 29(2), 117-122 (2005).
6. D. Connell, S. Dovers and R. Quentin Grafton, *Australasian Journal of Natural Resources Law and Policy* 10(1) 81 -86 (2005).
7. R. Connor, S. Dovers, *Property rights instruments: transformative policy options. Property: rights and responsibilities current Australian thinking*. C. Mobbs and K. Moore. Canberra, Land and Water Australia, 119-136 (2000).
8. D. Cooper, S. Jackson, *Preliminary study on Indigenous water values and interests in the Katherine region of the Northern Territory*. Darwin, CSIRO and North Australian Indigenous Land and Sea Management Alliance (2008).
9. D. Craig, D. In A. Smajgl & S. Larson (Eds.), *Adapting rules for sustainable resource use*. Townsville: CSIRO Sustainable Ecosystems 153-172, (2006).
10. J. Davidson, *American Indian Law Review* 24, 1-20 (1999-2000).
11. B. Derman, A. Hellum, *Land Use Policy* 24, 664-673 (2007).
12. E. Eberhardt, C.J. Robinson, J. Waterhouse, B. Hart, J. Parslow. R. Grayson, B. Taylor. *Marine and Freshwater Journal* (In press).
13. M. Durette, *Indigenous Legal Rights to Freshwater: Australia in the International Context*, Centre for Aboriginal Economic Policy Research ('CAEPR') Working Paper No 42/2008 (2008)
14. E. Eisenstadt, *American Indian Law Review* 17(1), 209-236 (1992).
15. J. Folk-Williams, *Natural Resources Journal* 28, 63-103 (1988).
16. D.H. Getches, S.B. Van de Wetering., *Integrating environmental and other public values in water allocation and management decisions. In search of sustainable water management: international lessons for the American west and beyond*. D. S. Kennedy. Cheltenham, Edward Elgar Publishing, 69-101 (2005).
17. M. Guerrero, American Indian water rights: the blood of life in native North America, *The state of Native America : genocide, colonization, and resistance*, M. Annette Jaimes. Boston, South End Press, 189-216 (1992).
18. M. Hamstead, C. Baldwin, et al., *Waterlines Occasional Paper No. 6*. Canberra, National Water Commission (2008).
19. H. Henderson, A. Wade, *A Research Section Occasional Paper No. 7*. Canberra, Australian Institute of Aboriginal and Torres Strait Islander Studies (1996).
20. R. Hill, Miriuwung and Gajerrong Peoples, D.G. Hill, S. Goodson, *Miriuwung-Gajerrong Cultural Planning Framework. MG Guidelines for developing Management Plan for Conservation Parks and Nature Reserves under the Ord Final Agreement*. WA Department of Environment and Conservation, Yawoorroong Miriuwung Gajerrong Yirrgab Noong Dawang Aboriginal Corporation and CSIRO (2008).
21. R. Hill, L.J. Williams, Indigenous natural resource management: overcoming marginalisation produced in Australia's current NRM model. In: *Contested Country: Local and Regional Environmental Management in Australia*, eds. M. B. Lane, C. J. Robinson & B. M. Taylor, pp. 161-178. Canberra: CSIRO Publishing (2009).

22. R. Hill, K.J. Williams, P. Pert, C.J. Robinson, A.P. Dale, D.A. Wescott, R. Grace, T O'Malley. Effective Community-based NRM for biodiversity conservation in Australia's tropical rainforests, *Environmental Conservation* (in review).
23. S. Jackson, *Australasian Journal of Environmental Management* 12, 136–46 (2005).
24. S. Jackson, *Australian Geographer* 37(1), 19-31 (2006).
25. S. Jackson, *Geography Compass* 2(3), 874-898 (2008).
26. S. Jackson, J. Altman, *Australian Indigenous Law Review* 13(1): 27–48 (2009).
27. S. Jackson, J. Morrison, *Indigenous perspectives on water management, reforms and implementation. Managing water for Australia: the social and institutional challenges*. K. Hussey and S. Dovers, Melbourne, CSIRO (2007).
28. S. Jackson, P. O'Leary, *Indigenous interests in tropical rivers: research and management issues*. Darwin, *Report to Land & Water Australia*, North Australian Indigenous Land & Sea Management Alliance (2006).
29. S. Jackson, M. Storrs, et al., *Ecological Management and Restoration* 6, 105–110 (2005).
30. S. Jackson,, P. Tan, et al., *Indigenous Fresh Water Planning Forum: Proceedings, Outcomes and Recommendations*. Unpublished Report to the National Water Commission (2009).
31. M.B. Lane., L. Corbett. *Journal of Environmental Planning and Management* 48, 709-31 (2005).
32. M.B. Lane *Journal of Planning Education and Research*, 25(2), 172-184 (2005)
33. M.B. Lane, L. Williams, *Journal of Planning Education and Research*, 28, 38-49 (2008)
34. M.B. Lane, C.J. Robinson, *Australasian Journal of Environmental Management* 16, 27-35 (2009).
35. M.B. Lane, C.J..Robinson, B. Taylor (eds). *Contested Country: Local and Regional Environmental Management in Australia*. CSIRO Publishing, Melbourne (2009).
36. M. Langton, 'Freshwater' in Background Briefing Papers: Indigenous Rights to Waters, Lingiari Foundation and Aboriginal and Torres Strait Islander Commission (2002).
37. M. Langton, L. Palmer, in McGlade, H (ed) *Treaty Now*, ATSIC, Canberra. (2003).
38. Lingiari Foundation, *Onshore water rights, A discussion booklet for the Aboriginal and Torres Strait Islander Commission*. Broome, (2002).
39. T. McAvoy, *Indigenous rights and interests in water*. *Water Law and Policy, 4th Australasian Natural Resources Law and Policy Conference*. Armidale, NSW, Country Conferences Pty Ltd (2002).
40. T. McAvoy, *Transforming Cultures eJournal* 1(2), 97-103 (2006).
41. B. McFarlane, *The National Water Initiative and acknowledging indigenous interests in planning*. Paper presented to the National Water Conference, Sydney 29 November 2004 (2004).
42. M. Morgan L. Strelein J. Weir. Authority, knowledge and values: Indigenous nations engagement in the management of natural resources in the Murray–Darling Basin. In M. Langton, O. Mazel, L. Palmer, K. Shain, M. Tehan (eds) *Settling with Indigenous peoples*. Federation Press: Annandale
43. L. Mehta, Z. Ntshona, *Sustainable Livelihoods in Southern Africa Research Paper 17*, Brighton, Institute of Development Studies (2004).
44. National Water Commission, *Update of progress in water reform: input into the water sub group stocktake report*. Canberra, Australian Government (2008).
45. National Water Commission, *National Water Initiative* <<http://www.nwc.gov.au/www/html/117-national-water-initiative.asp>> at 1 September 2009 (2009)..

46. G. Nettheim, G. Meyers, et al., *Indigenous peoples and governance structures: a comparative analysis of land and resource management rights*. Canberra, Australian Institute of Aboriginal and Torres Strait Islander Studies (2002).
47. C. O'Faircheallaigh, *Australian Indigenous Law Review* 11(3), 28-42 (2008).
48. C. O'Faircheallaigh, C. and T. Corbett, T. 2005, *Environmental Politics*, 14(5), 629-47
49. S. Pollard, *Social use of riverine resources. Environmental flow assessments for rivers: manual for the Building Block Methodology*. J. King, R. E. Tharme and M. de Villiers. Cape Town, Freshwater Research Unit, University of Cape Town, 95-115 (2000).
50. S. Pollard, *Giving people a voice: providing an environmental framework for the social assessment of river resource use in the Sabie River, South Africa. Enviro Flows 2002 4th Ecohydraulics* (2002).
51. Power and Water Corporation, *Indigenous Communities of the Northern Territory: Annual Drinking Water Quality Report*. Darwin (2008).
52. A. Putnis, P. Josif and E. Woodward. *Healthy Country, Healthy People*. CSIRO: Darwin, (2007). 232 pages
53. C.J. Robinson, *Geographical Studies* 39(2), 182-196 (2001).
54. C.J. Robinson, N. Munungguritj. Sustainable balance: A Yolngu framework for cross-cultural collaborative management, in R. Baker, J. Davies, E Young (eds), *Working on Country: Indigenous Environmental Management in Australia*, Oxford University Press, Melbourne, 92-107 (2001).
55. C.J. Robinson, H.A. Ross, M. Hockings, *Development of co-management arrangements in the Great Barrier Reef: An adaptive management approach*. CRC Reef Technical Research Report # 55, Townsville (2007)
56. C.J. Robinson, M.B. Lane, B. Taylor. The changing and contested governance of Australia's environmental heritage, in Lane MB, Robinson CJ, Taylor B (eds) *Contested Country: Local and Regional Environmental Management in Australia*. CSIRO Publishing, Melbourne, 243-245 (2009).
57. C.J. Robinson., S. Jackson, A. Straton, E. Eberhard, T. Wallington, P. Dzidic, J. Camkin. E. Bohensky. *Review of existing cultural and social initiatives and key organisations across Northern Australia associated with water*. WfHC report to the North Australia Water Futures Assessment Social and Cultural Working Group, Canberra (2009).
58. C.J. Robinson, R.D. Margerum, T. Koontz, C. Mosely, S. Lurie. *Society and Natural Resources* (in review).
59. J. Royster, *Kansas Journal of Law & Public Policy* XV(3), 489-503 (2005).
60. Rural Solutions, S.. *Aboriginal Access to Water Across Australia*. D. o. W. Government of South Australia, Land and Biodiversity Conservation. Adelaide (2008).
61. D. Smith, *Indigenous land use agreements: the opportunities, challenges and policy implications of the amended Native Title Act. Discussion Paper No. 163*, Centre for Aboriginal Economic Policy Research, Australian National University: Canberra.
62. Z.A. Smith, *Journal of Land use and Environmental Law* 2(2), 177-193 (1987).
63. J. Soussan, S. Pollard, et al., *Allocating water for home-based productive activities in Bushbuckridge, South Africa. Water and Poverty – the Realities. Experiences from the Field, 3rd World Water Forum, Kyoto, Japan, 16-23 March 2003, Kyoto, Japan, Asian Development Bank* (2003).
64. C. Sullivan, J. Meigh, *Water Resource Management* 21, 111-128 (2005).
65. P. Tan, Collaborative water planning: legal and policy analysis, unpublished report by TRaCK. Volume Three. Brisbane, Griffith University (2008).
66. P. Tan, 'Native Title and Freshwater Resources' in Brian Horrigan and Simon Young (eds), *Commercial Implications of Native Title* (1997) 157.

67. P. Tan, *A Review of the Legal Basis for Indigenous Access to Water*, National Water Commission (2009), 7 <<http://waterplanning.org.au/presentations/legal-basis-for-indigenous-water-access>> at 2 September 2009.
68. S. Toussaint, P. Sullivan, et al., *Anthropological Forum* 15, 61–74 (2005).
69. S. Toussaint, S. *Oceania* 78, 46-61 (2009).
70. S. Toussaint, V. Strang, V. eds. (2009) *Oceania*, 78,(1), 46-61 (2009).
71. E. van Wyk, C.M. Breen, et al., *Water SA* 32(3), 403-410 (2006).
72. J. Weir, *Murray River Country: An ecological dialogue with traditional owners*. Canberra, Australian National University. Doctor of Philosophy (2008).
73. T. Venn, T. J. Quiggan. *Ecological Economics* 61 (2007).
74. E. Willis, M. Pearce, et al.. *Water Supply and use in Aboriginal communities in South Australia: Report to South Australian Department of Aboriginal Affairs and Reconciliation*. Adelaide, Flinders University (2004).
75. S. Yu, *Ngapa Kunangkul: living water. Report on the Indigenous cultural values of groundwater in the La Grange sub-basin*. Perth, Western Australian Water and Rivers Commission (2000).
76. U. Zaar, G. Prowse, et al.. *Water Resources of East Arnhem Land*. Darwin, Northern Territory Department of Lands, Planning and Environment (1999).