

07 Indigenous interests in land & water

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Betty Roberts harvesting yarlbun (water lilies) in southern Arnhem Land, 2008

Photo: Yugul Mangi Land and Sea Management Corporation 2008. [Used with permission]

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1. KEY POINTS

1. Many Indigenous groups in northern Australia conceptualise water as part of the living cultural landscape and inseparable from land, people, ancestors and social relations. Relationships to water are expressed through story, social etiquette, ceremony and daily practices, and are highly significant in Indigenous economies, identities and ways of life. Indigenous perspectives on sustainability may incorporate the customary relationships between people and place, opportunities for economic development on country and the exercise of rights in water management and planning.
2. Economic models that only recognise the state and market sectors are inadequate for northern Australia. Indigenous people undertake productive activity in both the market and non-market (customary) sectors and many make their livelihoods through a combination of customary activity and market exchange with state support. This mix of activity challenges the notion that there is a dichotomy between consumptive/productive and non-consumptive/unproductive resource use. The market, state and customary sectors—and the intersections between them—are captured in the hybrid economy model.
3. Rights to water in northern Australia are contested. Indigenous people often see access to, and ownership of, water as issues of human rights. There is a need for greater clarity about water rights in northern Australia in order to improve Indigenous people's customary and commercial opportunities. Possible tensions between commercial allocations and Indigenous people's statutory customary use rights under S211 of the *Native Title Act 1993* (NTA) also need to be recognised and ameliorated. Indigenous rights to water are a valuable tool in addressing the significant socio-economic disadvantage of Indigenous people and assisting the Council of Australian Governments to meet its 'Closing the Gap' commitments.
4. Around 30 per cent of the northern Australian landmass is Indigenous-owned and close to one third of the region's population is Indigenous. In this context Indigenous people have a very significant stake in the region's economic futures and development trajectories. Prior to the National Water Initiative (NWI) Indigenous people have been largely excluded from water planning, so the NWI provides an important opportunity to recognise and support Indigenous interests in water and economic development. The commitment to Indigenous representation in NWI water planning processes must be properly resourced to assist Indigenous people to establish their objectives and have a real and decisive influence in decision-making. National standards and guidelines for meeting Indigenous needs in water planning and allocation would assist the States and Territories to effectively engage with Indigenous stakeholders.
5. Water is important for both customary and commercial economic activities. Indigenous people currently utilise water and aquatic ecosystems for the customary harvest of wildlife and floral species and a wide range of commercial enterprises (such as agricultural and pastoral operations, commercial art sales, nature and cultural tourism, safari/conservation hunting, plant propagation, commercial wildlife and bush foods ventures and land and sea management). Indigenous people are also employed in mining, pastoral, tourism and other industries. Water planning needs to recognise and accommodate the diversity of Indigenous economic activities and interests in water resources.

6. Indigenous people have a clear comparative advantage in economic niches on the large Indigenous-owned estate. These include provision of environmental services, carbon abatement, tourism, arts production and wildlife and bush foods enterprises. These emerging industries need start-up support and their sustainable development potentials need to be better understood. They offer clear opportunities for Indigenous economic development that meets Indigenous aspirations to stay on and care for country. More resources are also required for detailed studies that identify Indigenous peoples' needs and aspirations in water-dependent industries and establish the potential for sustainable expansion of these activities.
7. The hybrid economy is heavily reliant on natural resources. This poses distinct risks for Indigenous people whose livelihoods may be adversely affected by the development or expansion of water-dependent industries that impact on flows, generate pollution or accelerate the spread of invasive species. Such developments may both undermine the customary utilisation of resources and compete with Indigenous commercial interests. These risks to Indigenous livelihoods may be exacerbated by the predicted effects of climate change and these forecasts should be taken into account in water planning.

2. INTRODUCTION

2.1 Overview of structure and approach

Any consideration of economic futures for northern Australia must recognise the region's significance for Indigenous people. It is different from the more populated regions of southern Australia in having both a much larger Indigenous proportion of the population (over 30 per cent) and a much larger proportion of the Indigenous-owned estate (with around 30 per cent of the region Indigenous-owned). The rapidly growing Indigenous population means that economic futures in northern Australia will be increasingly interdependent with Indigenous people's livelihoods.

This chapter begins by addressing the question of Indigenous water rights (both property and access rights) that underpin many Indigenous livelihoods. It then turns to a brief discussion of Indigenous population projections for northern Australia and existing Indigenous socio-economic disadvantage. The chapter next reflects on Indigenous perspectives on water and water planning and identifies the range of economic uses of water that Indigenous people currently make. The wide range of uses identified means that a detailed analysis of the development potential of each one is not possible here. Instead, the remainder of the chapter focuses on one area of clear comparative advantage: Indigenous participation in land and water management on the Indigenous estate. This focus should not be interpreted as a privileging of such activity over others where Indigenous people have a commercial or customary interest. In providing this illustrative example of the development potential and institutional and capital needs of one type of activity, the chapter identifies some key principles of sustainable development that are relevant to other current and emerging industries in which Indigenous stakeholders enjoy comparative advantage or significant leverage.

2.2 Methods

This chapter draws on a rapid appraisal review of the literature on Indigenous peoples and land and water in northern Australia, with a focus on the values and uses of freshwater. Some contextual

details such as Indigenous population estimates have been garnered from Australian Bureau of Statistics (ABS) publications. There is a growing literature on Indigenous interests in land and water and it has not been possible to cover all of this work here. Material has been selected with the aim of highlighting the importance of water to Indigenous livelihoods and identifying key issues and principles for sustainable futures.

3. BACKGROUND INFORMATION: THE PRESENT STATUS AND HISTORICAL CONTEXT OF INDIGENOUS LAND AND WATER USES

3.1 Indigenous rights to land and water

Indigenous Australians commonly express their rights to water use and management under customary law. They argue that these rights stem from their deep and inalienable connection to the land and waters and their obligations as custodians to care for country. 'Country' is a broad concept that includes land, water, sky, minerals, people, other species, ancestors, social relations and sacred and heritage sites, with all of these elements intimately intertwined (1-4).

There is a growing (although still limited) recognition of the special nature of Indigenous interests in water. The National Water Initiative (NWI) explicitly requires the recognition of Indigenous needs in water management and the inclusion of Indigenous representation in water planning. This is crucial to ensuring that the diversity of Indigenous aspirations across northern Australia is reflected in decision-making and that development options enhance rather than limit Indigenous livelihood opportunities. Indeed, in the context of current Indigenous socio-economic disadvantage, water policy and allocation will be important tools to support Indigenous economic (customary and commercial) development.

As well as the commitment to Indigenous needs and engagement in the NWI, Australia is signatory to international agreements that acknowledge Indigenous rights to water resources. While these agreements are not binding they set out principles to guide the development of domestic policy and law. Key articles of these agreements are summarised in the box below.

Recognition of Indigenous rights and special relationship to water in selected articles

Intergovernmental Agreement on a National Water Initiative, 2004

Para. 25. ix) Water access entitlements and planning frameworks will recognise indigenous needs in relation to water access and management.

Para. 52. In accordance with relevant Commonwealth, State and Territory legislation indigenous access to water resources will be provided through planning processes that ensure the inclusion of indigenous representation in water planning wherever possible. Water plans will incorporate indigenous social, spiritual and customary objectives and strategies for achieving these objectives wherever they can be developed.

Para. 53. Water planning processes will take account of the possible existence of native title rights to water in the catchment or aquifer area.

Para. 54. Water allocated to native title holders for traditional cultural purposes will be accounted for (5).

United Nations Committee on Economic and Social and Cultural Rights, General Comment on the Right to Water, 2002¹

Article 7. Since the International Covenant on Economic, Social and Cultural Rights provides that a people may not 'be deprived of its means of subsistence' (article 1, paragraph 2), States parties should ensure that there is adequate access to water for subsistence farming and for securing the livelihoods of indigenous peoples.²

Article 16 (d). States parties should take steps to ensure that Indigenous peoples' access to water resources on their ancestral lands is protected from encroachment and unlawful pollution. States should provide resources for indigenous peoples to design, deliver and control their access to water (6).

United Nations Declaration on the Rights of Indigenous Peoples, endorsed 2009

Article 25. Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.

Article 26. i) Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.

Article 32. i) Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources (7).

Despite Australia's endorsement of these international instruments, Indigenous rights to water are often 'murky' and contestable in domestic law. Under S211 of the *Native Title Act 1993* (Cth) (NTA) native title holders have rights to the customary use of water and resources on their lands (8). Native title does not grant exclusive property rights in water. However, since title holders' customary economies are often highly dependent on fresh and salt water, allocations of water for other purposes or the pollution of water resources or disturbance of habitat by other users can impinge on, or impair, customary use rights. This leaves room for significant disputation where the same resource is governed by two different (and arguably incompatible) forms of ownership regime. For example, one could envisage a commercial water allocation being legally challenged because it impacts on a catchment that has customary (economic or cultural) significance to a native title group (8). This is a key point that needs to be considered in water planning, particularly in northern Australia where a significant proportion of land is owned under land rights or native title laws (9). In addition, it should be noted that where the management or regulation of water (including the granting of leases, licenses or other authority to take and use water) extinguishes or impairs native title rights and interests, native title groups are entitled to compensation by the Crown³ (S24HA of the NTA).

Aboriginal land in the Northern Territory is mainly owned under the *Aboriginal Land Rights (Northern Territory) Act 1976* (ALRA). Under ALRA the grant of freehold title does not include water (10). In 2008 the 'Blue Mud Bay' decision⁴ of the High Court affirmed that Aboriginal people who owned

¹ The General Comment on the Right to Water was issued in 2002 to assist in the implementation of the International Covenant on Economic, Social and Cultural Rights (ICESCR). ICESCR was ratified by Australia in 1975.

² This parallels S211 of the *Native Title Act 1993* (Cth). For many Indigenous people in northern Australia subsistence includes engagement with the customary sector.

³ A full analysis of the water legislation, plans and licences would be needed in order to establish whether native title has been extinguished or impaired. Under S227 of the NTA 'an act "affects" native title if it extinguishes the native title rights and interests or if it is otherwise wholly or partly inconsistent with their continued existence, enjoyment or exercise.'

⁴ The High Court decision (in *Northern Territory of Australia & Anor v Arnhem Land Aboriginal Land Trust & Ors* [2008] HCA 29) dismissed an appeal made by the Northern Territory government and upheld the earlier decisions of the Federal Court

coastal land under ALRA had title to the land extending to the low water mark.⁵ The decision gave landowners exclusive rights to control access to the water above the low water mark.⁶ This means that while the Northern Territory government has the power to grant commercial fishing licences, it does not have the right to allow commercial fishers entry to tidal waters (including tidal rivers) over Aboriginal-owned land. It also means that recreational fishers may have to acquire permits from landowners to fish. The decision implicitly acknowledges the adverse impacts of commercial and recreational fishing in the inter-tidal zone on traditional owners' social, cultural and economic interests. It is highly significant in the Northern Territory as it affects more than 5,000 kilometres (or around 85 per cent) of the Territory's coastline.

While the Blue Mud Bay decision resolves the question of access rights to the inter-tidal zone on land held under ALRA, such clarity about water rights has not been established either on the terrestrial estate or under native title law. Moreover, property rights remain contestable and murky owing to land and native title rights, with a likely outcome being increased transaction costs emanating from contestation. It should be noted that in some parts of the Northern Territory (especially Arnhem Land) entire river catchments (headwaters, banks, beds and mouths of large river systems) are encapsulated by Aboriginal land. While the traditional owners of the land are not recognised as owning the water in these catchments under Territory or federal law, ownership remains contested and, because access is restricted by a permit system, the practical meaning of Crown ownership remains unclear. In this and other contexts the assertion of Crown ownership of water resources may be experienced as another form of alienation by Indigenous stakeholders.

The NWI can be strengthened first by recognising that rights to access, manage and own water resources remain contested and second by developing mechanisms to ensure that the Indigenous representation clauses within the initiative are effectively implemented.⁷ Options such as the co-management of water resources or the hypothecation (reservation) of commercial water entitlements to Indigenous stakeholders should be explored.⁸ The complex institutional context of Indigenous rights and interests in water are examined in more detail in other chapters.

3.2 Indigenous population characteristics in northern Australia

3.2.1 Indigenous population projections

While most Indigenous Australians live in the country's south (particularly in the heavily populated coastal regions and urban centres), Indigenous people in northern Australia constitute around 30 per

(in *Gawirrin Gumana v Northern Territory of Australia* (No. 2) [2005] FCA 1425 and *Gawirrin Gumana v Northern Territory of Australia* (No. 1) [2005] 141 FCR 457).

⁵ Hence, traditional ownership extends to the area between the high and low water marks. Due to large tides in the Arafura Sea and the geology of the coastline this is a considerable area. This decision confirmed that Crown lands reserved for Aboriginal use had extended to the low water mark and that this precedent was incorporated in ALRA in 1976 when reserved lands were scheduled as Aboriginal land held under inalienable freehold title by the Arnhem Land Aboriginal Land Trust.

⁶ Access is controlled under the permits system.

⁷ Since responsibility for water planning and management ultimately lies with the State and Territory governments—and each of these jurisdictions approaches Indigenous interests in water (and native title) differently—national standards and guidelines for meeting Indigenous needs in water planning and allocation are required (10).

⁸ The history of water management in southern Australia demonstrates how difficult it is to buy back entitlements once they have been granted to competing uses/users (10).

cent of the total population (see Table 1). The Indigenous proportion of the population increases even further outside the north's major urban settlements (11). The growth rate of the Indigenous population is predicted to significantly exceed non-Indigenous growth in coming decades so that, if rates of fertility, mortality and migration remain unchanged, by 2031 Indigenous people will make up over 36 per cent of the region's residents.

Table 1 provides the estimated resident population in 2006 for Northern Australia and the Rest of Australia for Indigenous and non-Indigenous people. It also gives the projected population for 2011, 2021 and 2031. The methods used in deriving these figures, along with more detailed projections (for males and females, at five-year intervals), are provided in the Appendix to this chapter.

Table 1 Population estimates and projections, Indigenous and non-Indigenous people, 2006 to 2031

	2006	2011	2021	2031
Northern Australia				
Total Indigenous	84604	90041	102962	114972
Total non-Indigenous	191984	197844	203429	203218
<i>Proportion Indigenous</i>	<i>30.6</i>	<i>31.3</i>	<i>33.6</i>	<i>36.1</i>
Rest of Australia				
Total Indigenous	422870	471949	590016	720633
Total non-Indigenous	19773557	21086115	23390556	25191025
<i>Proportion Indigenous</i>	<i>2.1</i>	<i>2.2</i>	<i>2.5</i>	<i>2.8</i>

Source: Calculated from Australian Bureau of Statistics data.

3.2.2 Indigenous socio-economic disadvantage

In the most recent Overcoming Indigenous Disadvantage (OID) report released in 2009, Indigenous Australians were shown to fare worse than non-Indigenous Australians on almost every headline indicator. Indigenous Australians have lower life expectancies, higher infant mortality rates, lower rates of education, employment, and home ownership, and higher rates of incarceration, chronic disease and disability (12). While the disadvantaged socio-economic position of Indigenous Australians is well recognised, it is particularly important in the context of water planning in two key ways. First, there is great potential for water as an element in Indigenous socio-economic development. Water rights and the proper resourcing of commercial opportunities in water-dependent industries can facilitate increased Indigenous enterprise development and income-generation.

Second, water planning needs to recognise the lack of potable water in some Indigenous settlements in northern Australia. Data on potable water supply to discrete Indigenous communities are collected in the Community Housing and Infrastructure Needs Survey (CHINS). While separate data for northern Australia are not publicly available, an indication of water quality issues in the region can be gained from the data on remote Indigenous settlements in Western Australia, the Northern Territory and Queensland. In the 2006 CHINS, 69 per cent of discrete Indigenous communities in remote and

very remote areas in Western Australia, the Northern Territory and Queensland relied on bore water for their potable water supply. Only 14 per cent were connected to town water.⁹ Across the three jurisdictions the water supply failed quality testing in 38 communities, with the majority of these communities in Western Australia and the Northern Territory (13).¹⁰ Prior to any future allocation or trade in fresh water, priority needs to be accorded to the basic human right of Indigenous people to potable water.

3.3 Indigenous perspectives on country, water and the economy

3.3.1 Indigenous perspectives on water

Indigenous groups in northern Australia have conceptualised water sources and rivers as deriving from the Dreaming (14). Creation ancestors form part of the living or sentient cultural landscape such that caring for country (including water sources) and sacred sites, engaging in burning, hunting and foraging and practising ceremony maintain connections to spirituality, culture and country (4, 15). Rose has suggested that Aboriginal peoples' relationships to country are like kinship relationships of care and obligation (16). In many parts of the north, Indigenous relationships to water are expressed through story, social etiquette, ceremony and daily practices, and are highly significant in Indigenous economies, identities and ways of life (4, 14, 15, 17-21). For these reasons water is also important in the communication of Indigenous ecological and cultural knowledge to future generations.

Indigenous water values in the Daly River

In her research on Indigenous river values in the Daly River region of the Northern Territory, Jackson (16) notes that a range of groups value the river highly for its water volume, constant flow and good water quality. They also value the river as the location of breeding areas and habitat and refuge for important populations of turtles, fish and waterbirds. Jackson also notes Aboriginal concerns that the river is a 'significant ceremonial track' (16) and that land-use change could adversely effect rivers, wetlands and groundwater aquifers (14). She suggests that 'for the Daly Aboriginal groups it was their relationship with a living, healthy river system which was so highly valued, alongside the ability to reproduce these relationships in place.' This meant, for example, that in decisions about land and water management Indigenous people sought to nurture and sustain their customary relationships to place rather than just protect the places in and of themselves. For this reason Jackson proposes that, in understanding Indigenous water values in similar contexts, a relational perspective of value may be useful. This perspective moves away from objectifying, listing and ranking values in favour of a recognition of the importance of Indigenous peoples' socio-ecological relationships with place (16).

Across northern Australia relationships to water and the ways in which these are expressed vary among Indigenous groups. Some may emphasise the importance of water to ceremony and want to restrict commercial uses; others may prioritise the commercial potential of water allocations.

⁹ A further 7 per cent relied on a river, well, spring or other reservoir, 4 per cent accessed drinking water from rain water tanks and 3 per cent relied on carted water. Just under 1 per cent (8 communities) had no organised water supply. Percentages refer only to those communities where data is available. Across Western Australia, the Northern Territory and Queensland 97 communities (out of a total of 1,036) did not provide data on water supply.

¹⁰ Some of these communities are no doubt in central Australia but there is also evidence of inadequate domestic water supply in parts of the tropical north.

Divergent views may exist among land-owners, between settlements or between family-groups. Nonetheless, across the diversity of Indigenous views on water a number of key themes emerge.

The first theme—predicated on cultural obligations to care for country—is the common assertion that any development of water resources must be ecologically and culturally sustainable (neither undermining ecological health nor disturbing sacred sites or sites of significance). Developments that threaten the sustainability of water ecosystems can have potentially devastating consequences for Indigenous people, not only in terms of livelihood but also in terms of broader cultural and spiritual wellbeing. As noted in the previous section, such threats may also impinge on Indigenous people’s legal rights to the customary use of resources under native title law. Indigenous people’s relationship to country may lead, in some cases, to distinct perspectives on sustainability.¹¹

Indigenous views on water and economic futures: Stewardship and sustainability

Indigenous Peoples have rights, responsibilities and obligations in accordance with their customary laws, traditions, protocols and customs to protect, conserve and maintain the environment and ecosystems in their natural state so as to ensure the sustainability of the whole environment ... As traditional owners we have an inherent right to make decisions about cultural and natural resource management in Northern Australia ... Any policies and legislation that are developed in water allocation and management in North Australia needs to ensure that Indigenous rights are paramount ... Indigenous peoples have always been part of and are crucial to the maintenance of our ecosystems and therefore want to ensure minimal impact from settlement and unsustainable development across Northern Australia.

Mary River Statement, August 2009 (22).

When it comes to the protection of rivers ... those rivers [in Cape York] should remain in the way that they’ve been managed by Aboriginal people for thousands of years ... Cape York Peninsula hosts the most pristine rivers in this country and all of those rivers, bar a few, are on Aboriginal land. Now that says everything about the stewardship of the traditional owners, of the rivers on their land ... They’ve been owned by the traditional owners for many hundreds and thousands of years and they will remain pristine for centuries into the future so far as Indigenous people are concerned.

Noel Pearson, 15 July 2009 (23).

The second common theme is the assertion of rights to be active participants in water planning and to have a real and decisive influence on outcomes. These rights are strongly asserted regardless of peoples’ positions on appropriate water management and uses. The third common theme is the frequent call for commercial, and not just customary, water rights to be recognised. In the context of Indigenous socio-economic disadvantage and the aspiration of many to stay on country, commercial rights to water will be important for improved economic futures. While there may be tensions between the desire to utilise water and aquatic ecosystems commercially and the commitment to ecological sustainability and cultural and spiritual integrity, these goals are not necessarily

¹¹ This is not to suggest that Indigenous and non-Indigenous people do not share significant values and concerns with cultural and social relationships, environmental protection and economic development. Indeed, Jackson (16) notes that values are created and re-created in an intercultural social context and suggests that the tendency to reify Aboriginal ‘cultural values’ as distinct from other (Indigenous and non-Indigenous values) has perpetuated the exclusion of diverse Indigenous interests in water planning.

incompatible. For example, in his opposition to the Queensland Government's Wild Rivers legislation (*Wild Rivers Act 2005*¹²) Pearson has argued for the continued environmental protection of the Cape York Peninsula alongside the opportunity for (small-scale) Aboriginal-owned commercial enterprises that utilise river resources (23).

The three themes outlined in this section—prioritising sustainability, property rights and commercial opportunities—were prominent in discussions at the 2008 Garma Indigenous water forum (24) and at the recent North Australian Indigenous Experts Water Futures Forum convened by the North Australian Indigenous Land and Sea Management Alliance (NAISMA) at Mary River. Key themes from the latter are highlighted in the box below.

Key themes from the North Australian Indigenous Experts Water Futures Forum: sustainability, rights and commercial opportunities

In August 2009 the North Australian Indigenous Land and Sea Management Alliance (NAISMA) convened a meeting of 80 Indigenous leaders from across northern Australia to discuss the region's water futures. Participants identified a number of key concerns and principles for sustainable development (25). They noted the continued ignorance of non-Indigenous water users, developers, governments and institutions about Indigenous cultural values in water and the continued exclusion of Indigenous people from decision-making. They highlighted their role as custodians of water resources and their rights to be included in water planning. Delegates also noted their desire to explore economic development opportunities through the sustainable use of water. An important output of the forum is the Mary River Statement, a strong declaration upholding Indigenous peoples' inherent rights to participate in and contribute to policy development and highlighting the deep and intrinsic connections between land, water and Indigenous peoples.

3.3.2 Sustainable development

Inappropriate 'developments' associated with significant environmental degradation, cultural change, alienation and social tension have historically been commonplace in northern Australia. There are clear lessons to be learnt from past failures. Since Europeans first drove cattle into the expansive tropical savannas of northern Australia in the 19th century, the region has been regarded as a vast wilderness waiting to be developed. Development, it seemed, could only happen on a grand scale to match the vastness of the landscape. Huge pastoral stations of many thousands of square kilometres were quickly and remotely mapped and sold—often speculatively.

The doctrine of *terra nullius* (land belonging to no-one) provided an ideological prism through which the colonisers could ignore the property rights of Indigenous Australians, the owners of the land, its waters, minerals, and flora and fauna. Indigenous estates encompassed the entirety of the tropical savannas, but with their land and resources alienated Indigenous Australians would not play any role (except through the extraction of their labour) in the 'development' of the north until the late 20th century.

The development of the north has not been characterised by robust planning, local knowledge of the environment or innovative partnerships with Indigenous Australians. For nearly fifty years

¹² And amendments in 2006 and 2007: *Wild Rivers and Other Legislation Amendment Act 2006*; *Wild Rivers and Other Legislation Amendment Act 2007*.

researchers have documented the limits to sustainable development in northern Australia (26) and examined the reasons why European attempts at agricultural and industrial development have failed (27, 28).¹³ For example, in a recent study of forestry, agriculture, pastoralism and mining developments in the Northern Territory researchers Woinarski and Dawson found that many European attempts at large-scale development in the Northern Territory were spectacular failures. That is, they had such a degrading impact on the environment or benefited so few individuals that they could not be seen as successful projects—un-costed public and intergenerational costs greatly exceeded private benefits.

Woinarski and Dawson's study demonstrated patterns and characteristics in these failed developments that must inform sustainable development policies and practices of the north today:

- The environment is poorly known and dissimilar to that from which its developers originated. This strangeness has contributed negatively to the attribution of value to that environment and its component parts;
- The environment is extensive and this scale engenders the perception that successful use of lands can be achieved only by large-scale development;
- The environment is perceived to be so extensive and of so little value that little safeguard needs to be built in to development proposals;
- Repeated development failure reinforces the perception that the land is of limited value, and hence few resources should be directed towards understanding it (or rehabilitating it after development failure);
- The environment is perceived to be so marginally productive that the only route to substantial profits is through intensive modification of the environment and large-scale development;
- The economic framework supporting settlers is so tenuous that developers and their supporters (government) consider that development shouldn't be burdened by substantial imposed conservation regulations (28).

Drawing from Woinarski and Dawson's work some key considerations for sustainable development emerge. In particular, northern Australian environments need to be better understood and valued as unique and relatively fragile ecosystems. In practice this means that effective governance, regulatory regimes and the inclusion of Indigenous ecological knowledge and management are required to ensure the maintenance of ecosystem health and limit industrial and agricultural development to a suitable scale. The environmental carrying capacity will limit the size of appropriate developments.

In addition, consideration needs to be given to definitions of 'sustainable development.' This is a contested concept and debates about its meaning are highly relevant for Indigenous people in northern Australia. The oft-cited Brundtland Report of the World Commission on Environment and Development (WCED) states that 'sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' Further, it states that 'sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life' (29). Key concerns, then, are the questions of how needs, aspirations and a 'better life' are defined and how rates of depreciation are quantified. A common critique of the concept of sustainable development is that while needs and

¹³ The findings in both studies are remarkably similar.

aspirations can only be ascertained through engaged consultation and debate, policy-makers and commercial developers may espouse a commitment to sustainable development while actually imposing their own normative views about what needs, or whose, are most important to meet (30).

In northern Australia, the incorporation of Indigenous needs and aspirations into definitions of sustainable development may move its meaning away from simply the ecological sustainability of resource use to recognise the interconnections between land, water, culture and economy. Indigenous perspectives on sustainability may include questions of social justice, property rights in land and water, self-governance or co-management of resources and the effective engagement of Indigenous people in decision-making (31). Indeed, following the Brundtland definition, sustainable development requires that Indigenous peoples' own development aspirations have a real influence in policy choices and development decisions. This aligns with a significant international literature that demonstrates that the most effective development projects are those that work with, rather than against, the values and practices of local people (32-34). The inequitable economic and social situation of Indigenous Australians in northern Australia clearly indicates that equitable sustainable development of the region is yet to happen.

3.3.3 Indigenous economies

While the cultural importance of water to many Indigenous people is increasingly recognised, Indigenous commercial and economic interests in water are less readily acknowledged (16, 35).¹⁴ The economic use of water resources and related ecosystems encompasses customary activities (including the harvesting of floral and faunal species) as well as commercial operations (whether for import substitution or market exchange). Economic activity in both the customary and market sectors is clearly captured in the hybrid economy model (36, 37). This model moves beyond a mainstream view of the economy as comprising only the state and market (or public and private) sectors by also recognising customary engagement (see Figure 1). The model acknowledges the lived realities of many Indigenous people in northern Australia who engage in productive economic activity outside the market and make their livelihoods in the intersecting spaces (segments 4, 5, 6 and 7 in Figure 1) where market, state and customary sectors overlap. For example, they may rely on a combination of the customary use of natural resources (especially wildlife harvesting), cash incomes from the sale of goods and services (such as arts and crafts), and social security payments or other kinds of state support (for instance through the Community Development Employment Projects (CDEP) scheme).

The size of the circles and intersecting spaces in the hybrid economy model can change to reflect the relative importance of each sector in different local contexts and at different points in time. It can also accommodate the mobility of Indigenous actors between segments in the model over time, or concurrent participation in different segments at the same time. It is important to note that the hybrid economy model is inclusive of commercial and state-funded engagements with the market (that is, it does not seek to deny the importance of the market sector). Rather, it highlights the

¹⁴ In her research on Indigenous river values in the Daly River region, Jackson has asked whether a focus on Indigenous cultural values in water planning can actually obscure Indigenous people's economic, social and political interests in water and water management. She notes that many activities Indigenous people engage in are simultaneously economic, cultural and social (16).

importance of customary economic activity and conceptually emphasises the empirical complexity of the Indigenous economy.

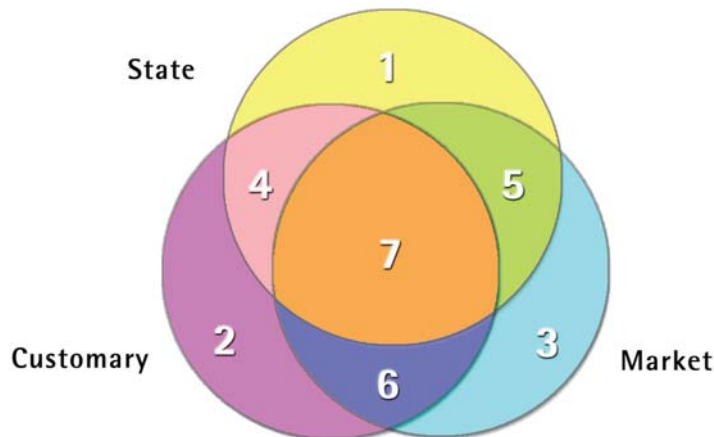


Figure 1 The hybrid economy model
Source: J.C. Altman assisted by V. Branchut (38).

Many activities in the hybrid economy are highly reliant on water and natural resources. For example, arts production for the market may rely on the availability of plant species that are water-dependent. Similarly, wildlife harvesting and many commercial enterprises rely on a ready supply of clean freshwater. Provision of environmental services, often as land and sea rangers, is an increasingly significant avenue for paid work. While the types of water-dependent activities currently occurring in the hybrid economy of northern Australia are too numerous to document here, some illustrative examples are provided in section 3.5. Future prospects for sustainable livelihoods in the hybrid economy on the Indigenous estate are outlined in sections 4 to 6.

3.4 History of Indigenous land and water uses in northern Australia

The history of Indigenous land and water uses in northern Australia spans tens of thousands of years. Over millennia Indigenous uses of water have been managed through complex social and cultural relationships and institutionalised in Indigenous law. While the social, cultural and economic significance of water has not diminished with non-Indigenous settlement, major transformations in Indigenous land and water uses have occurred. Recent research has documented the impact of these changes on Indigenous peoples' use of wildlife and natural resources in West Arnhem Land, and similar examples are found in other regions where non-Indigenous colonial encroachment has come relatively late. The West Arnhem Land study shows that the customary use of flora and fauna to sustain Indigenous livelihoods has remained a core element of the local economy. However, markets for goods and services have also become significant sites of economic activity and most livelihoods are underwritten by the state.

From Fish Creek to Mann River: tracking changes in Indigenous land and water use

An early study of Aboriginal food consumption at Fish Creek in 1948 provides an unusual opportunity for reflecting on continuity and change in wildlife harvesting over the past 60 years. The results can be compared to subsequent studies at nearby sites in West Arnhem Land in 1979–1980 and 2002–2003. The Fish Creek study found a people still heavily reliant on fishing, hunting and gathering for their nutritional and utilitarian needs. While the researchers noted the beginnings of the state’s penetration into daily life—with the men and women commonly procuring goods (flour, rice, tins and cloth) from the mission at Gunbalanya—the collection and consumption of a range of flora and fauna species to provide balanced nutrition suggests a vibrant customary sector had been maintained.¹⁵

The second study, carried out some thirty years later, documented the economy of Kuninjku speakers (who’s linguistic, ceremonial and cultural identities were related to the first group of research participants at Fish Creek) who camped on the Mann River about 100 kms from the original study site. Here, based on estimates of market replacement value using social accounting and local prices, the harvesting of wildlife for production and consumption in the customary (non-market) sector was estimated at 64 per cent of the local economy. The state and market sectors had both entered the local economy since 1948 and now accounted for 26 per cent and 10 per cent of income respectively, the latter mostly in the form of arts and craft sales. Cash was used to purchase some western foods and residents had access to a limited range of services underwritten by the Australian state.¹⁶

The third study recorded the economic activity of the same group of Kuninjku speakers in 2002–03. In the twenty years since the previous study at Mann River the importance of the customary sector had declined to an estimated 32 per cent of the local economy. Market activity had increased only marginally to 11 per cent but state support, in the form of social security payments and employment in the CDEP scheme, had grown to account for 57 per cent. This change reflected the more equitable payment of welfare transfers rather than a decline in participation in the customary sector. While the customary harvesting of wildlife remained strong, the nature of customary engagement had changed, with more discretionary income allowing the increased purchase of guns and vehicles and therefore more short-term visitation onto country for hunting and far more focus on harvesting large species like feral buffalo (39).

While the economic importance of state support is clear in the box above, more opportunities for market engagement in the natural resources and primary industries are also emerging. Across northern Australia these opportunities are diverse and may include agricultural enterprises, commercial fisheries, commercial arts production and payment for the provision of environmental services. Many of these activities integrate customary and western scientific knowledge. Economic activities in the hybrid economy are briefly explored below.

¹⁵ The study was experimental in that participants were required not to consume any western foods (which they had limited access to via the mission) during the study period. Nonetheless its record of the collection and consumption of a wide range of floral and faunal species to provide balanced nutrition (based on nutrient estimates in the foods consumed and the daily recommended allowances current at the time) for around four hours of work per person per day does suggest the persistence of a vibrant customary sector in day-to-day life.

¹⁶ Note that while most productive activity occurs in the intersections of state, market and customary sectors, quantification of contributions is undertaken at the higher level represented by the entire circles 1, 2 and 3 in Figure 1.

3.5 Water and land resources in the hybrid economy

3.5.1 State sector

The state (the first segment in Figure 1) is critical to the functioning of regional economies in remote Australia. In Indigenous communities, as elsewhere, the state is service provider, law enforcer, regulator and provider of a welfare safety net. The proportion of economic activity carried out or underwritten by the state in remote Indigenous communities may be relatively large since engagement with the market is often limited. While there is a tendency among some commentators to see the reliance of remote Indigenous communities on a relatively high degree of state support as indicative of their limited viability (40), the unusual historical, structural, cultural and locational characteristics of these communities means that the state plays, and will continue to play, a crucially important role in their futures.

This situation is not unique to Indigenous communities. For example, under the principle of fiscal equalisation between the States and Territories, the Commonwealth Grants Commission (CGC) distributes around five times the monies to the Northern Territory as it does to benchmark States like Victoria and New South Wales. This distribution is designed to ameliorate the lower revenue-raising capacity and relative expense of providing services in the Northern Territory (41). Applying this same principle it is unrealistic to expect remote Indigenous communities to become economically independent of the state even in the long term. Nonetheless, the hybrid economy—based on creative engagement with the customary, market and state sectors—can be highly productive, adaptable and resilient.

3.5.2 Customary sector

The customary sector (segment 2) is made up of a range of productive activities that occur outside the market and that are based on cultural continuities: hunting, gathering and fishing occur within the customary sector, but so too do a range of other activities like land and habitat management, species management, fire management and the maintenance of biodiversity. A distinctive feature of the customary sector is that it is not monetised; consequently, its value has remained unquantified and generally unrecognised in mainstream terms. Notably, the dominant non-Indigenous view of water as a resource with competing environmental, commercial, recreational and cultural values renders the customary sector invisible (10).

The nature of the customary sector and its significance to local communities varies considerably by location. In many Indigenous communities across Australia's north, particularly those in remote regions and where colonial and settler contact occurred recently, the reliance on the customary sector remains high (42-44). For example, the 2000–01 Indigenous Fishing Survey found that 92 per cent of Indigenous adults had fished in the survey year (45). The 2002 National Aboriginal and Torres Strait Islander Social Survey found a hunting and fishing participation rate of up to 82 per cent (46). Detailed local-level studies have also highlighted the significant contribution that customary use of wild resources can make, particularly in remote Indigenous communities in Australia's north (31, 47-54). Study areas have included the Dampier Peninsula in Western Australia, Cape York Peninsula in Queensland and Belyuen and the Maningrida region in the Northern Territory. The level of reliance on the customary sector may also be significant in Indigenous townships in northern Australia. For

example, recent research in Maningrida has shown the importance of natural resources in sustaining livelihoods even in an 'urban' setting.¹⁷



Figure 2 Cherry Daniels and Trishaun Rogers harvesting yarlbum (water lilies) in southern Arnhem Land, 2008
Photograph: Yugul Mangi Land and Sea Management Corporation 2008. [Used with permission].

While customary production is generally regarded as self-provisioning (import substitution) it can also generate important positive externalities especially in environmental services provision (42, 55), the maintenance of social networks (56) and the social and cultural wellbeing of Indigenous people (21, 36). The economic and nutritional importance of customary food sources becomes even more pronounced when viewed alongside the relatively low levels of cash income, the lack of formal employment opportunities, and the expense of fresh and nutritious store foods.

The customary sector in Cape York

Research carried out in Cape York in the mid-1990s showed that most residents participated in customary production, with a variety of land- and water-based resources used to produce food, utensils, fuel, medicines and arts and crafts (31). Customary production was very significant in meeting nutritional needs (with Indigenous groups getting around 80 per cent of their protein from wild resources) and hunting and fishing were also important socio-cultural events that allowed the transfer of customary knowledge to younger generations. Using imputed market prices it was estimated that the customary production of food across Cape York Peninsula was worth at least \$6 million each year.

3.5.3 Market sector

Indigenous participation in the market sector (segment 3) may take various forms. For example, people may utilise land and water resources in establishing commercial ventures for import-substitution or market exchange. The provision of commercial services in the private sector includes nature and cultural tourism, recreational/conservation hunting and fishing, carbon abatement

¹⁷ See *Wurridjal & Ors v The Commonwealth* High Court challenge to the compulsory acquisition of the Maningrida township lands.

activities and formalised natural resource management. The production of commodities for sale includes commercial harvesting of wildlife, arts production that involves the use of natural materials, agricultural enterprises, commercial production of bush foods and plant propagation. Indigenous participation in the market sector also includes employment in private enterprise (such as mining and agricultural industries).¹⁸ These industries are examined in detail elsewhere in this report. It is important to note that in northern Australia many Indigenous communities' market activities are underwritten by the state and dependent on customary knowledge, blurring the boundaries between the sectors in the hybrid economy.



Figure 3 Djelk Ranger Mischat Rostron collecting crocodile eggs for Bawinanga Aboriginal Corporation Sustainable Wildlife Enterprise, Liverpool River, 2007
Photograph: Bill Fogarty. [Used with permission].

3.5.4 The customary-state intersection

Over the past 30 years much of the productive participation of Indigenous Australians in the customary sector has been supported by engagement with the state and the market. One example in the customary-state segment (segment 4) is Indigenous people's environmental management work on country that has predominantly been underwritten by both the recognition of land rights/native title rights and direct state support (such as through CDEP or other publicly-funded programs). Indigenous Australians often term environmental management activities 'caring for country' (57).¹⁹

¹⁸ In 2006 around 2.7 per cent of the Indigenous labour force in Western Australia, Queensland and the Northern Territory was employed in the agriculture, fisheries and forestry industries (13). The percentage may be somewhat higher in the tropical north of those three jurisdictions.

¹⁹ Some clarification of terms is useful. The informal term 'caring for country' is notated in this chapter in lower case. Caring for country activities include non-remunerated land and sea management as well as paid activities in the Northern Land Council's Caring for Country Unit (upper case) and the federal government's Working on Country program. The Working on

Remunerating Indigenous people for their provision of environmental services has been strongly supported by programs developed by Aboriginal organisations themselves (like the Northern Land Council's Caring for Country Unit). In recent times, it has received further support and become more formalised through Commonwealth Government initiatives such as the Indigenous Protected Areas (IPAs) and Working on Country (WoC) programs (introduced in 1997 and 2007 respectively). The potential for further development of payment for environmental service work is discussed in more detail in section 4. As well as relying on government support under WoC, some Indigenous natural resource management (NRM²⁰) groups have entered into contractual ('fee-for-service') arrangements with government agencies to provide particular services like customs surveillance or quarantine monitoring.



Figure 4 Garawa Ranger Coordinator Jack Green conducting early dry season burn, 2007
Photograph: Sean Kerins 2007. [Used with permission].

Payment for environmental services

Indigenous Protected Areas (IPAs) and Working on Country (WoC) are both elements of the federal government's 'Caring for our Country' initiative. IPAs are Indigenous-owned lands (sea country is currently not included) which traditional owners agree to have voluntarily included within the Australian Government's National Reserve System (NRS). As part of this agreement the Australian Government provides some funding for the management of country by land owners through an agreed IPA Plan of Management. WoC builds on Indigenous caring for country initiatives by employing Indigenous people to provide environmental services. This goes some way towards recognising the wide variety of work that Indigenous Australians are doing in maintaining ecosystem services. Such formalised Indigenous NRM is a clear example of development that, when properly remunerated, can support Indigenous livelihood through small-scale, community-controlled projects.

Country program is part of the government's Caring for our Country initiative. The term 'caring for country' was popularised with the publication of Elspeth Young's book *Caring for country: Aborigines and land management* in 1991 (58).

²⁰ Natural resource management (NRM) is not a term used by most Indigenous Australians. In using the term it is acknowledged that from an Indigenous perspective cultural heritage management is not seen as separate from NRM, but as an integral part of a holistic system.

3.5.5 The market-state intersection

Indigenous economic activity in the market-state segment (segment 5) includes commercial enterprises that are underwritten by the state (either through CDEP employment or other forms of enterprise support), employment in non-Indigenous private sector enterprises that is facilitated by state subsidies (such as through the Corporate Leader for Indigenous Employment Project scheme), and Indigenous enterprises that rely on the allocation of commercial water licences. In some instances the state directly contracts Indigenous groups for services including border protection (quarantine control and reporting on illegal foreign fishing boats) (59). The market-state intersection also includes commercial enterprises that are run on land acquired by the Indigenous Land Corporation (ILC), a statutory authority that receives annual draw-downs from the investment income of the \$1.4 billion Aboriginal and Torres Strait Islander Land Fund.

Aboriginal pastoralism in the Kimberley

In the Kimberley region, around one third of the cattle stations are now Aboriginal-owned (60). These properties have been acquired for Aboriginal people by the ILC or other government agencies. Aboriginal pastoral properties in this region are often different from other pastoral stations in key ways. For example, some Aboriginal lease-holders see the opportunity to obtain a lease primarily as a way of acquiring land where other avenues to obtaining title are closed. Many have facilitated the return of people to their homelands. Other lease-holders see the access to land primarily as a basis for commercial enterprise. Hence, while some properties are run as large commercial operations, others have focused on small-scale production primarily to provide 'killer' beef to homeland communities. This may both augment customary hunting activities and provide a valuable substitution to expensive imports of fresh meat. Ad hoc cattle sales may also be used to supplement income. While stocking rates are set by the State's Pastoral Lands Board, each station differs in how it allocates resources between commercial goals and local consumption. Most workers on Aboriginal-owned stations have been employed through CDEP, suggesting an ongoing need for state wages support (61).

3.5.6 The customary-market intersection

Economic activity in the customary-market intersection (segment 6) is probably the smallest segment in the hybrid economy but includes art sales direct to galleries and buyers²¹ and joint ventures that require customary involvement but are not predicated on state support. For example, as well as entering into fee-for-service contracts with government departments, some Indigenous NRM groups have entered into direct contracts with corporate entities. Lianthawirriyarr Rangers are one such organisation, providing search and rescue services for the King Ash Bay Fishing Club on the McArthur River. Adjumarllarl Rangers (Gunbalanya) and Tiwi Land Rangers (Tiwi Islands) respectively provide services to assist Queensland Mines Pty Ltd and Matilda Minerals in the rehabilitation of mine sites (59). Again, the boundaries between sectors are often blurred, with most ranger groups also relying on state funding for other activities.

²¹ It should be noted there is some concern about exploitation of Aboriginal artists in sales direct to dealers and buyers. There has been some involvement of the state in attempting to ensure appropriate commercial standards, with the Australian Competition and Consumer Commission (ACCC) investigating allegations of illegal dealings in the industry and instigating legal action in several cases.

3.5.7 The customary-state-market intersection

The customary-state-market segment (segment 7) is often quite large. Many productive economic activities undertaken by Indigenous people rely on a combination of customary knowledge and practices, state support and market exchange. For example, art from country is often marketed through community-controlled arts centres that receive state patronage (grant funding under the National Arts and Crafts Industry Support program, subsidies or funding for wages under CDEP). Some Indigenous associations (such as Outstation Resource Agencies) have used state support and commercial profits to establish businesses in safari/conservation hunting, sports fishing (including joint ventures) or cultural or nature tourism. Indigenous people are also employed in the commercial harvest of bush foods and other bush products (such as the Kakadu or billy goat plum) (62, 63), with businesses sometimes able to draw on state funding for training or other forms of public investment.

One successful example in the customary-state-market intersection is the West Arnhem Land Fire Abatement (WALFA) project. This joint venture utilises customary knowledge, state support (through CDEP positions and the WoC program) and private investment (a commercial contract and global philanthropic contributions).

West Arnhem Land Fire Abatement agreement

WALFA is a commercial agreement based on customary knowledge of fire management that produces a tradable carbon offset. It is a partnership between traditional owners of West Arnhem Land, the Northern Land Council, fire ecologists, five Aboriginal community-based ranger groups and the energy company Darwin Liquefied Natural Gas Pty Ltd (DLNG). Under the agreement DLNG has committed around \$1 million per annum over a seventeen-year period so that Indigenous rangers can partially offset the company's greenhouse gas emissions in Darwin through strategic fire management in western Arnhem Land. The project relies on both customary knowledge and western science and was described in the 2007 *Native Title Report* as a successful project that 'fits perfectly into the remote communities that it engages with because it represents commercial opportunities from carrying out the cultural activity of fire management' (64). WALFA employs 30 Indigenous people and, while it is the first such agreement worldwide, similar schemes are being planned elsewhere on the Indigenous-owned estate, especially in the fire-prone tropical savannas.

4. INDIGENOUS ECONOMIC FUTURES IN LAND AND WATER, AND LIKELY IMPACTS

The above discussion demonstrates that across northern Australia there are economic opportunities for Indigenous people in utilising land and water resources in a wide range of customary and commercial activities. This section focuses on one area in which Indigenous people have a clear comparative advantage: that is, payment for the provision of environmental services. Along with other goods and services produced on the Indigenous estate where customary knowledge attracts a commercial return (such as arts production, tourism and the commercial utilisation of wildlife) we can refer to these as 'competitive intercultural products.' With hundreds of small Indigenous settlements dotted across the vast Indigenous estate, and much of the estate in sound ecological health, there are unique opportunities in such industries. Lessons about land and resource uses to be avoided can be learnt from the country's more densely settled southern regions, where such opportunities have been undermined by large-scale agricultural and industrial development and the over-allocation of water resources.

4.1 Focus on the Indigenous estate

4.1.1 Establish the geographic extent and location of the Indigenous estate

The Indigenous estate has been defined as ‘the aggregate area of Australia’s land mass which is held by, or on behalf of, Aboriginal peoples and/or Torres Strait Islanders under a corporate or group title or trust’ (9). In northern Australia, the Indigenous estate currently accounts for approximately 30 per cent of the landmass (over 500,000 km²) and consists predominantly of land that is owned by Indigenous people under land rights or native title legislation or other freehold title. This proportion increases significantly in the Northern Territory, with more than 40 per cent of the land and over 85 per cent of the coastline currently Aboriginal-owned (20). The Indigenous estate in northern Australia takes in a significant proportion of the region’s water resources, including some river catchments that are entirely within Aboriginal-owned land.

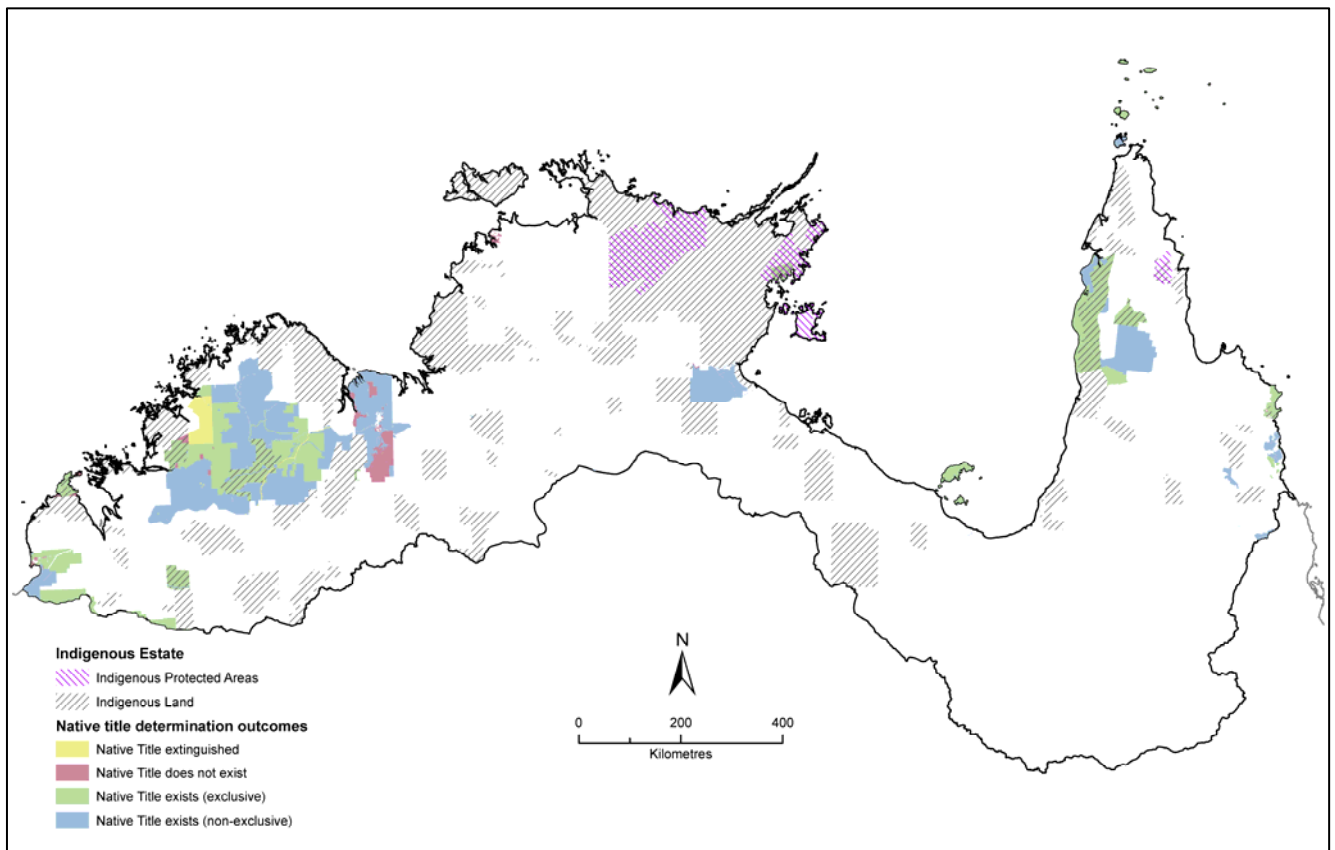


Figure 5. Indigenous Estate map

Source: 1. Australian Government Department of the Environment, Water, Heritage and the Arts
2. National Native Title Tribunal. *The Registrar, the National Native Title Tribunal and its staff, members and agents and the Commonwealth (collectively the Commonwealth) accept no liability and give no undertakings, guarantees or warranties concerning the accuracy, completeness or fitness for purpose of the information provided. In return for you receiving this information you agree to release and indemnify the Commonwealth and third party data suppliers in respect of all claims, expenses, losses, damages and costs arising directly or indirectly from your use of the information and the use of the information you obtained by any third party.*

Research has shown that the Indigenous estate includes some of the most biodiverse lands in Australia (9, 65). Mapping also shows that these lands are at risk of species contraction and face major threats from feral animals, exotic weeds, changed fire regimes, pollution and overgrazing (66). There is significant overlap of the Indigenous estate with the conservation estate in northern Australia (65) in the form of joint-management of one Commonwealth national park (Kakadu National Park), joint- or co-management of state and Northern Territory national parks, and sole-management of Indigenous Protected Areas. Other significant economic land uses on the Indigenous estate include pastoralism and mining.

4.1.2 Opportunities in land and water management

There is growing scientific evidence that much of the Indigenous estate has environmental and cultural values that match or exceed those in conservation reserves in northern Australia. The latter will become increasingly co-dependent with the Indigenous estate for minimising species loss in the face of ecological pressures such as encroaching development and global warming. These threats mean that the environmental management of the Indigenous estate is increasingly critical to ensure optimal biodiversity conservation and to minimise species loss at a time of predicted rapid climatic change. Section 3.5.4 noted the active participation of Indigenous people in formalised NRM activities, with numerous ranger projects established to counter threatening ecological processes. There are clear opportunities for Indigenous people to undertake more environmental management work on these lands as such threats grow.

Much of the damage to the Indigenous estate has stemmed from the colonial development of the north. For example, damaging wildfires now occur predominately across lands from which Indigenous Australians have been removed as a consequence of past government policy (15). Invasive species that were introduced to aid development—including horses, pigs, buffalo, camels and cane toads, or buffel, gamba and mission grasses, mimosa, Parkinsonia and rubber vine—have had unintended negative consequences on ecological health. Many of these species have significant impacts on freshwater in northern Australia and need to be controlled in order to protect this valuable resource. Ranger groups are responding to these and other threats by undertaking a portfolio of activities including fire management, feral animal and weed control, biodiversity monitoring and threatened species protection (59).

Invasive species and freshwater points in northern Australia

Freshwater points, especially permanent spring-fed billabongs, swamps, creeks and rivers are sparsely scattered throughout the vast expanse of the savanna woodland ecosystem. These freshwater points are crucial to local and regional ecologies, offering refuge for many animals—such as emu, kangaroos, wallabies and dingoes—and habitat and breeding sites for water birds, freshwater crocodiles, fish, turtles and file snakes. They are also inhabited by a unique suite of flora including *Melaleuca* sp., freshwater mangroves and lilies which provide a food source for animals and people inhabiting these areas. Animal use, the occurrence of many perennial plants as well as the perennial source of freshwater in the highly seasonal wet-dry climate of northern Australia has drawn Indigenous people to these freshwater points for millennia (67). Permanent freshwater points therefore hold significant ecological, cultural and economic value for Indigenous people in northern Australia.

The integrity of permanent freshwater points in northern Australia is currently threatened by invasive exotic weeds and feral animals. Climate change will be a growing threat in coming years. Threatening invasive weeds include cabomba, mimosa, hymenachne and salvinia. All are classified as Weeds of National Significance (WONS) in Australia and have potentially detrimental environmental and/or economic impacts (68). They are also declared weeds across northern Australia where legislation requires reasonable attempts to at least reduce their spread. If this country is left un-managed, rapid weed invasion is a predictable result.

A number of exotic feral animals pose threats to the integrity of permanent freshwater habitats in northern Australia, including buffalo, pigs, horses, donkeys, goats and cane toads. Hard-hooved ungulates (buffalo, pigs, horses and donkeys) have been shown to damage key freshwater ecosystem parameters such as soil stability, bank stability and water quality (69, 70). This damage has flow-on effects to aquatic and riparian biota. For example, Fordham has shown that aestivating freshwater turtle populations are threatened by crushing from pig trampling (71). Taylor and Friend have demonstrated that feral buffalo can affect native bird, reptile and mammal species abundance (69, 72). Cane toads have advanced across much of northern Australia and are known to be responsible for a significant decline in reptiles, quolls and other amphibians (73-75).

When viewed from afar, formalised Indigenous NRM activity might be seen as a large-scale development since it already encompasses extensive areas of land and sea country in the north of Western Australia, the Northern Territory and Queensland. However, viewed closer to the ground it can be seen as many small-scale cultural and natural resource management initiatives developed at the community level.

Each of these caring for country initiatives has a specific development history which has grown 'from the ground up' out of Indigenous attempts to manage ecological threats. Indigenous owners of country, with complex ecological knowledge of their estates, could see localised damage becoming more and more common and rapidly spreading to other intact environments. In response, they have established regionally-based and locally-appropriate environmental strategies to respond to ecological threats while also creating jobs for young people living on country.



Figure 5 Emilie Ens (CAEPR) and Yugul Mangi Rangers Julie Roy, Rose Munur and Edna Nelson testing water quality of Nulawan billabong near Ngukurr, 2009
Photograph: Courtesy Emilie Ens 2009. [Used with permission]

As part of this process Indigenous land-owning groups have developed partnerships with peak Indigenous organisations, research institutions and some government departments. Senior traditional owners have begun to develop land and sea country plans detailing the incremental steps needed to facilitate the ecological recovery of their country. Emerging from a participatory community development model and with relatively limited funding, many NRM groups have now evolved (or have the potential to evolve) into for-profit or social enterprise organisations carrying out payment for environmental service (PES) work. Caring for country projects have become a significant employer in northern Australia, providing jobs to many hundreds of people living and working in some of the remotest and harshest climatic regions of the country. For example, there are now around 500 Indigenous people working in Indigenous NRM groups in the Northern Territory (59). The Northern Land Council's (NLC) Caring for Country Unit (CFCU) alone now supports 35 Indigenous land and sea management groups that employ more than 400 people and bring around 50 per cent of the Indigenous-owned land in the territory under a more formalised management regime (20).

Recent research has shown that many Indigenous organisations and government agencies see Indigenous NRM groups as among the most productive and important community-based organisations in communities in northern Australia (59). These groups are achieving a wide range of benefits in environmental restoration and protection, improved educational outcomes, better health, stronger cultures and communities, and better outcomes in employment and economic development (9, 21, 59, 76-84). As well as improving the economic, social and cultural wellbeing of Indigenous people and protecting the Indigenous estate for future generations, the work provides valuable environmental services that underpin economic futures for Indigenous and other stakeholders in the country's north.

Effective management of Mimosa by the Djelk Rangers

Indigenous Rangers who are out on country offer substantial advantages for the control of weeds and the early detection of new weed alerts. For example, the Djelk Rangers in central northern Arnhem Land have been working for many years to control the spread of mimosa in floodplains and riparian zones (85). Mimosa (*Mimosa pigra*) is a prickly shrub from South America that has invaded floodplains of the Top End of the Northern Territory. It has the potential to spread across coastal areas of northern Australia from Broome to South east Queensland (86). Mimosa is a major threat to river wetlands and forms dense thickets (68) that exclude native flora and reduce habitat and food resources for native fauna. It has been shown to negatively impact the abundance of water birds as well as interfere with stock watering, irrigation, tourism and recreational and customary water uses (87).

The Djelk Rangers have spent the last few years controlling outbreaks of mimosa in the Djelk Land Management area (Maningrida and outstations of the Liverpool, Mann, Blyth, Cadell and Tomkinson River catchments) using chemical control methods and fencing to keep out feral buffalo which spread mimosa (85). The vigilance and persistence of the Djelk Rangers has resulted in containment of small infestations and control of further mimosa spread. Without the work of the Djelk Rangers, mimosa would have invaded much of northern Arnhem Land and the increased propagule abundance would have facilitated further spread by animal, water and vehicle dispersal agents.



Figure 6 Fence built by Djelk Rangers to exclude animal dispersal agents, including feral buffalo, from an isolated *Mimosa pigra* patch, Tomkinson River floodplain, 2008
Photograph: Emilie Ens 2008. [Used with permission]

4.2 Given these potential opportunities describe the socio-economic requirements

A recent evaluation of Indigenous land and sea management in the Top End of the Northern Territory (80)²² made key recommendations for strengthening Indigenous NRM activities. These include: improved coordination among relevant organisations and agencies; the provision of funding over longer time frames to mitigate climatic, social and other technical challenges; streamlined administrative requirements related to funding applications and reporting; active training and mentoring of future leaders within ranger groups to ensure long-term viability; higher priority given to the conservation of Indigenous knowledge; development of rangers' capacity to document their activities; development of suitable incentive structures to reward land and sea management activities; and a review of current procedures for forming ranger groups to ensure that the right people are involved and consulted. Many of these issues are relevant for Indigenous NRM groups across northern Australia. This section focuses on needs in capital investment, services, skills development and institutional change.

4.2.1 Capital needs, infrastructure, services

Formalised Indigenous land and sea management is a clear example of sustainable development in northern Australia that, when properly funded and remunerated, can support Indigenous economic futures through small-scale, local projects. While some public sector support for Indigenous peoples' caring for country initiatives has come in the form of CDEP, IPAs, WoC and fee-for-service contracts,

²² This community-led evaluation consulted with 70 per cent of the formal ranger groups in the Top End, seven groups operating outside the formal network and two operating outside the NLC region as well as three Landcare groups. It was undertaken by CSIRO Sustainable Ecosystems in partnership with the Aboriginal Land and Sea Management Review Team (ALSMRT) which was formed specifically to provide input into the evaluation project.

additional investment is required. For example, funding for IPAs is relatively small when compared to funding for national parks (65). While the IPA scheme is deemed successful and many Indigenous groups seek to participate in it, it allows the Australian Government to increase the size of its National Reserve System at low cost. This perpetuates underinvestment on the Indigenous estate (88). Similarly, while the WoC program provides some support for wages, a more integrated approach to funding is needed that takes account of requirements for capital, infrastructure, governance support and capacity building.

Wages and the Community Development Employment Projects scheme

Initially, much formalised Indigenous land and sea management was undertaken through the Northern Land Council's Caring for Country Unit via annual allocations under the CDEP scheme (89). Recent changes to CDEP mean that by mid-2011 all participants (except those in the Torres Strait Islands) will be transferred to income support. The federal government now funds over 400 full-time Indigenous ranger positions under the WoC and Caring for our Country programs, with this funding employing people outside of the CDEP scheme. This overcomes some concerns that had been raised about CDEP funding.²³ However, the WoC positions are still funded under short-term allocations, with projects only funded to mid-2013.

In addition, while full-time wages are welcome, the effective abolition of CDEP means that not only will fewer positions be funded, but also that Indigenous organisations will lose the key source of funding that had supported the development of new caring for country enterprises. CDEP-administering organisations have also provided ongoing support to ranger groups through administration and human resource services and access to equipment and vehicles (59). For example, the Djelk Rangers in Arnhem Land were established as a small enterprise in 1991, employing eight men with funding through the local CDEP organisation Bawinanga Aboriginal Corporation (BAC) who have provided institutional support. Djelk has since expanded to include more than 30 male and female rangers and has secured funding outside of CDEP (90). In the absence of other forms of micro-finance and institutional support, the loss of CDEP funding will make establishing new ranger enterprises along similar lines more difficult. It should also be noted that for some people CDEP positions have been a useful 'stepping stone' into Working on Country jobs, as clearly evident during the Northern Territory Emergency Response (NTER) intervention where people exited CDEP into salaried WoC positions when made available.

As of 2007 (the latest year for which data are readily available), Indigenous land and sea management groups used CDEP for 90 per cent of partial wage payments, capital assets and human resource management (59). Arguably, there is room for both an expansion of full-time wage support under WoC (to take up more of the shortfall where CDEP positions have been or will be lost) and a publicly-subsidised part-time employment scheme that assists people to transition into full-time

²³ Participants received CDEP wages for 4 hours per day and then 'topped up' their wages through land and sea management grant monies. Such arrangements increased administrative burdens on small Indigenous land management agencies and Indigenous land managers were calling for proper remuneration to recognise the work they were doing on behalf of wider Australia. The disparity between payment systems for Indigenous and non-Indigenous land managers became very apparent when partnerships were built between Indigenous Caring for Country programs under the NLC and government agencies. Here, Indigenous people received CDEP plus top-up but no other associated employment benefits – such as holiday pay, sick leave or superannuation – that non-Indigenous people received for doing the same work. It should be clear that the nature of CDEP payments has been predicated largely on the state rather than the NLC.

work where this is available but keeps them gainfully employed where there are insufficient full-time public or private sector jobs.

Moreover, wage support is insufficient to ensure the sustainability of NRM groups. While environmental work is extremely valuable, in reality many of these groups remain very fragile, under-resourced and reliant on a multitude of small specific-purpose grants which invariably only fund project costs. There are significant shortfalls in funding for management and infrastructure costs, community planning, governance support and education and training. Funding may come from a range of different sources, and ranger groups themselves may have limited control over how these monies are allocated. The fragmentation of funding also means that ranger groups face significant administrative and reporting burdens.

Capital funding

One area where greater investment is urgently required is in the provision of workplaces or ranger bases. Indigenous land managers are professional people yet many have to work in trying and sometimes unsafe circumstances. Many ranger bases lack appropriate storage facilities to lock away equipment, fuel and poisons. In many instances equipment must be kept outside, shortening its life expectancy due to climatic conditions or theft. Under current arrangements funding is often available for operation equipment but rarely for equipment storage.

Under-investment in workplace facilities at ranger stations

Yugul Mangi Land and Sea Management Corporation is one land management group in northern Australia that operates out of an old shipping container. With no air-conditioner and a single computer and phone, for eight months of the year this 'office' is literally a sweat box, making it enormously difficult to undertake office work and computer training. This same group has no toilet facilities at their base. Rangers working here have also reported that when they take their uniforms home to wash, particularly after they have been using poison to spray weeds, their children's clothes begin to smell of the spray. This is of great concern and may have health implications. It is very rare that ranger bases will have any showering facilities for washing after work or lockers to store work clothes (91).

Activities of ranger groups may also be curtailed by the lack of appropriate housing for coordinators and science research collaborators. For example, many groups operate through partnerships with government organisations, research institutions and training agencies. Potential visitors from these organisations may be unable to offer face-to-face support or experience the rangers' work first-hand because they cannot secure accommodation. A similar constraint hinders NRM groups that identify the need for an external coordinator to assist with management (especially paperwork, grant-reporting, planning and partnership-building). In some cases, even when a suitable candidate has been identified they cannot be recruited as there is nowhere for them to live. In others, coordinators (like community members) live in trying circumstances which ensures a high turn-over rate and a lack of corporate knowledge. Both situations reduce productivity.

Local and regional planning

To be successful, formalised indigenous land and sea management needs to be based on customary law, ensuring that those who have the right to speak and make decisions for country are involved in all steps of the planning process. This can be complex as a land owners' residence may be located a great distance from their country and the land owners for one area are often spread across several settlements. It is essential that land owners be brought together to plan and make decisions for country and provide authority for rangers to undertake work. In most cases a number of meetings are required so that land owners can be kept informed and guide land and sea management on an ongoing basis.

Under current funding arrangements, it is enormously difficult to find sufficient funds for planning meetings. However, while planning can be time-consuming and involve significant up-front costs, it is necessary to ensure consensus-building and the sustainability of projects over time. In the last decade there has been strong agreement both nationally and internationally that people need to participate in and shape their own development, with evidence showing the effectiveness of community-driven projects that reflect local peoples' priorities and needs, are informed by cultural knowledge and are culturally appropriate (78). This bottom-up approach to planning suits local circumstances, helps to resolve disputes, builds partnerships and is therefore cost-effective for the long-term management of land and sea country.

Planning for the Roper River

In the Roper River region the right to speak for and make decisions about country is shared by the *Minirringgi*, *Junggayi* and in some areas *Darrnyin*. Persons in these categories have different rights and responsibilities in relation to looking after country and its sites, with each category of people essential to the process. If one category is absent then the decision remains fragile and open to dispute. In different contexts the rights and responsibilities of one may be given emphasis over another, but all are required to discharge their responsibility for country. Therefore, the right to speak for, and make decisions about country is not the sole responsibility of one category, let alone one individual. Building community-based development on customary law has ensured, in many places, a strong sense of ownership of the emerging cultural and natural resource management initiatives (91).

Planning is also needed at the regional level. For example, while many Indigenous NRM groups focus on dealing with threatening ecological processes on their own lands, many of these threats are spread wider than one specific land owning group's country. The threat may spread on to neighbouring lands or be present in another region many hundreds of kilometres away. In many instances one water catchment area is home to many groups. For example, the Fitzroy Valley in the Kimberley is occupied by at least 30 Aboriginal communities and includes seven ethno-linguistic groups. Different communities may have very different aspirations and social and political structures (14).

In carrying out land management it is sometimes the case that one group is trying to solve a problem for which another group has already found a solution. Limited resources mean that joint meetings of different ranger groups, or visits to learn from other groups' activities, are not possible. The problem

of regional ecological threats is clearly evident in dealing with feral animals. For example, one group may be focused on repairing and restricting buffalo damage in important wetlands, while the neighbouring group is focused on sea country and unaware that the unmanaged population of buffaloes from their country are moving into and damaging their neighbour's land. Another group may have a no cull policy because they see buffalo as a resource for safari/conservation hunting. These differences in management priorities mean that a lack of regional-scale planning can undo much productive local work and undermine investment. Resources are needed so that Indigenous NRM groups can begin to develop broader regional/cross-border planning and management strategies.



Figure 7 Planning meeting, Robinson River Garawa Land Management, 2005
Photograph: Courtesy Sean Kerins 2005. [Used with permission].

Governance support

Governance is an important area for further investment. Many land and sea management groups without robust governance institutions are struggling to operate, stagnating, or have collapsed or will collapse. The most robust groups have an overarching governance institution which assists the group in its day-to-day activities and future development. Having capable local institutions is essential to achieving development outcomes. Key to this is the 'human development approach' and the building of capacity, meaning 'the ability of individuals, organisations and whole societies to solve problems, make informed choices, order their priorities and plan their futures, as well as implement programs and projects to sustain them' (92). Participatory and bottom-up planning processes can assist in developing governance institutions, but specialised assistance in governance is also urgently needed. This is extremely important as government investment and emerging opportunities (such as in carbon abatement projects) can be wasted due to lack of support for local Indigenous governance institutions. Paradoxically, governance support is one area of Indigenous NRM for which it is enormously difficult to secure funds.

4.2.2 Skills, labour

There are many emerging opportunities for Indigenous Australians in natural and cultural resource management. These include Geographical Information Systems (GIS) analysts, remote sensing operators, ecologists, botanists and planners. Currently, very few of these positions are filled by Indigenous people. Increasing Indigenous representation in these positions requires greater investment in education and training. Relevant education should start within the school environment, with curricula demonstrating the relevance of literacy and numeracy to caring for country and Indigenous livelihoods. School-based learning can be linked to on-country education that is underpinned by Indigenous ecological knowledge. Where adequate education and training are provided there is a ready labour supply for formalised Indigenous land and sea management, with many Indigenous people aspiring to live and work on country.

4.2.3 Energy needs and supply

Vehicle fuel in Indigenous townships is often very expensive, meaning that the poorest Australians inevitably pay the most for this commodity. There is a need to consider a fuel subsidy for Indigenous start-up businesses in natural resource management and other industries in order to improve competitiveness and viability.

Many Indigenous settlements on the Indigenous estate are small, remote and beyond the electricity grid of the larger townships. Even in the townships much energy supply is diesel-power generated. Diesel is both expensive and, in remote areas, difficult to source (93).²⁴ Some small homelands/outstations are experimenting on an ad hoc basis with solar photovoltaic or hybrid solar/wind/diesel systems. It would be useful to audit the effectiveness of these various systems and consider extending them to other communities. Indigenous communities may also be well placed to pilot alternate forms of power generation including stand-alone small-scale systems. Innovative energy supply projects can enhance people's capacity to manage energy infrastructure locally. There is currently emerging best practice in remote power systems from the Centre for Appropriate Technology (CAT). CAT's Bushlight project (94) has installed 129 solar systems in remote Aboriginal communities (93). However, the Federal Government's decision to end the Renewable Remote Power Generation Program (RRPGP) (except in Western Australia) in June 2009 has effectively removed 50 per cent of Bushlight's capital works funding.²⁵ While the ramifications of this decision are not yet clear, it may result in a contraction of the Bushlight program and fewer installations of power systems in remote communities (93, 95).

²⁴ Residents of some remote communities have to regularly drive long distances on poor roads to purchase diesel fuel.

²⁵ All of the 129 systems installed in remote Aboriginal communities were funded under the RRPGP, which paid half the capital costs of off-grid systems to a maximum of \$200,000 (93). The balance of capital works funding has been paid by the federal Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA). The Bushlight project will continue to receive \$2.2 million over two years from DEWHA and an additional \$1.1 million per annum from FaHCSIA but these funds are to support project operations and cannot be used for capital works (95).

4.2.4 Market access, trends and risks

Underfunding

While the trend over the last fifteen years has been the expansion of payment for environmental service activities (both in terms of the number of groups and individuals involved and the types of activities they are engaged in), underfunding and the lack of appropriate support services (in training, education, planning and governance support) means that many Indigenous NRM groups remain fragile. This lack of secure funding and support remains the biggest risk to this emerging industry.

Unsustainable / over-development

Significant risks also include those posed by other potential developments in northern Australia that could further threaten the region's ecosystems and undermine Indigenous rights to land and water. Should economic development proceed unsustainably, Indigenous people face particular risks in that their cultures and livelihoods are often more heavily dependent than those of non-Indigenous Australians on ecological health.

Even small-scale and piecemeal pastoral development could destroy ecological corridors across the tropical savanna and undermine the work of Indigenous land managers. In addition, new developments such as irrigated agricultural projects that remove water from rivers or groundwater aquifers may have unintended consequences for Indigenous livelihoods and cultures, making it increasingly difficult for Indigenous people to live on country. Mining developments can alienate tracts of land owned by Indigenous people under native title or land rights legislation. Notably, legislation in the Northern Territory currently places no limit on the quantity of surface or ground water mines can access. The over-allocation of water to non-Indigenous enterprises, the pollution of waters on Aboriginal-owned land (including coastal areas) and the disruption to water-dependent species are all ways in which inappropriate development could undermine Indigenous economies in both the customary and market sectors. It is important to note the possible implications for the state, with native title holders entitled to compensation from the Crown where future acts granting leases or licenses to access and take water extinguish or impair native title rights and interests.

It should also be acknowledged that Indigenous peoples' own customary and commercial uses of water and water-dependent resources may not always be ecologically sustainable. More research and investment is needed to establish the ecological limits of any current or proposed economic activity (96).

Climate change

Indigenous land and sea management, and Indigenous livelihoods on Aboriginal-owned land, will also face considerable challenges with the onset of climate change. Threats across northern Australia are likely to include an increased intensity of tropical cyclones (with more cyclones growing to categories four and five), increasing temperatures (especially in inland areas), coastal inundation and more frequent damaging storm surges. There is also likely to be species loss, changed migratory patterns of important species and a changing spread of disease, disease vectors and invasive species (97, 98). For example, the combined effects of changed temperature, rainfall and extreme weather events will likely increase the potential range of *Mimosa pigra* (87). Indigenous land and sea managers will need

to adapt quickly to the changing environment and pressures from agricultural, pastoral and mining developments may exacerbate the environmental risks.

There may also be opportunities for Indigenous land and sea managers in responding to climate change. Existing opportunities in fire management, and potential opportunities in the management of forests and wooded ecosystems, can be supported through appropriate legislative frameworks and state support. Ranger groups may also have an expanded role in the monitoring of climate change impacts in northern Australia. For example, photographic records can document changes to wetlands, rivers and coastal zones by providing a baseline reference and periodic updates (99).

4.2.5 Institutional changes

There are significant institutional changes that are needed for the sustainable economic potential of the Indigenous estate to be fully realised. Principal among them are the formal recognition of Indigenous rights to water; increased funding for Indigenous NRM; and recognition of the distinctive features of the hybrid economy.

Clarification of water rights

Opportunities for Indigenous enterprise development are closely intertwined with questions of rights to resources. Section 3.1 highlights the lack of clarity about Indigenous water rights under native title and land rights legislation. This is a concern in Indigenous NRM because the damage to water ecologies from over-development or the over-allocation of water can undermine Indigenous livelihoods on country and the ability of Indigenous stakeholders to effectively manage the environment. Significant institutional change is required to clarify Indigenous rights in water, particularly in cases where entire river catchments are encapsulated by Aboriginal land or where Indigenous people own the land on one side of a river.

Better funding arrangements

The Working on Country program is Indigenous specific, but being nestled under the umbrella of the mainstream Caring for our Country initiative it has a set of mainstream, government-led priorities. The effectiveness of the WoC program will be in its ability to meet Indigenous specific needs and priorities and therefore be an effective model in providing support for Indigenous development. At present there is a need for a more holistic and less sectoral approach to funding Indigenous land and sea management.

The WoC program would benefit from the different funding packages from the federal Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and Department of Education, Employment and Workplace Relations (DEEWR) coming under the one stream (perhaps the Department of Environment, Water, Heritage and the Arts (DEWHA)). In the longer term, if the Working on Country program continues to be endorsed locally then the program should be scaled up, with other government agencies and available funding sources investing in the WoC framework.

One possible source of funds for projects in the Northern Territory is the Aboriginals Benefit Account (ABA). The ABA receives the equivalent of mining royalties raised on Aboriginal-owned land in the Northern Territory. It is used for three things. First, to fund Land Councils to carry out their statutory

responsibilities (annual disbursement usually of 40 per cent); second, to pay compensation to traditional owners and others in areas affected by mining (annual disbursement of 30 per cent); and third, for other initiatives for the benefit of Aboriginal people in the Northern Territory. The balance of funds held in the account is available for this third purpose. It can be rolled over from year to year and the accumulated balance is currently in the vicinity of \$200 million (100).

The third use operates through a system where Aboriginal people and organisations apply to the ABA for grants. This system can be ad hoc. Some organisations like the NLC's Caring for Country Unit developed application forms that land and sea management groups could use to apply. The CFCU then collated all the applications and presented them as one streamlined process. The applications are assessed by the ABA Advisory Committee (ABAAC) which is made up of Indigenous representatives elected by the four Northern Territory land councils and a chairperson appointed by the relevant federal Minister (101). However, the ABAAC acts only in an advisory role. When the committee has agreed to fund specific projects they have sometimes been overruled at a later date by the Minister or his/her delegate. In these cases applicants have usually not been told why their applications have failed, and there is no right of appeal. This is a major shortcoming in the ABA process as it undermines Indigenous autonomy and aspirations. Further, the ABA is often seen by the Australian Government as a fund that they can access to fund their own policies, which on some occasions do not have the support of the ABAAC.

In the Australian Labor Party's (ALP) 2007 election platform on 'Indigenous economic development' the party identified the ABA as under-utilised (102). In reference to the ABA and other assets such as the Aboriginal and Torres Strait Islander Land Fund the statement noted that:

There are significant Indigenous financial assets which are currently under-utilised and in many cases, burdened with red tape. Indigenous Australians are entitled to expect that these assets will be used to leverage additional private investment and secure Indigenous jobs and economic development.

The ALP was critical of the limited use of the ABA in the decade to 2007, with only one third of the available funds having been released by the federal government in that period. They argued that this had inhibited Indigenous economic development and suggested that they would better handle the fund by streamlining application processes, developing a clear policy on the approval of low interest loans from the account, requiring that a five year strategy be tabled in federal parliament and making sure that funds from the ABA were not used to pay for services that would normally be provided by government (102).

The ABA is viewed by many Aboriginal people in the Northern Territory as Aboriginal money to be used for the social, cultural and economic development of Aboriginal initiatives. This view is in sharp contrast to those of governments who have at times utilised ABA funds for their own priorities, even when their decisions have been opposed by Aboriginal people. The operation of the ABA requires review and restructuring.

Making better use of the ABA: empowering the ABA Advisory Committee

In 2006 four land and sea management groups tried to overcome a key obstacle to their sustainable operation by seeking funding for living accommodation for coordinators. They applied to the ABA for funding to purchase demountables for this purpose. While the ABA Aboriginal advisory committee saw this as a worthy investment and supported the application, the Minister or his delegate rejected the request. As a result the applicant NRM groups have stagnated.

A restructure of the ABA is needed to ensure that the ABAAC is empowered to make final decisions regarding the investment of ABA funds without government override. This would ensure that any government proposals are considered and consented to by the Indigenous fund managers. Such a restructure would, in all likelihood, facilitate many bottom-up Indigenous NRM initiatives in the NT with longer term support.

The ABA cannot fund activities outside of the Northern Territory. However, there are opportunities to establish alternative and innovative investment schemes across northern Australia using a combination of public and private sector funds. For example, an Indigenous Profit-Related Investment Program (IPRIP)—an innovation investment fund for the Indigenous estate—could fund start-up projects that align with local aspirations.²⁶ Under the IPRIP scheme the federal government would establish a series of new funds (with an initial tranche of \$100 million) for investment in commercial projects on Indigenous land in partnership with Indigenous corporations. Fund managers chosen by select tender would manage each fund and raise or contribute between 10 and 30 per cent of the fund's starting capital, with government contributing the balance of each fund's capital base. Each fund would be required to invest in a number of commercial projects and it would be mandatory for each project to include a minimum Indigenous financial equity holding of at least 30 per cent. Funds would have a finite life, say ten years, and would have to be wound up on a commercial basis at the expiry of that period. Projects that were going concerns after 10 years could be divested to Indigenous participants, although this would be subject to negotiation (88).

As a profit-contingent loan or capped public investment mechanism, IPRIP would help to overcome the lack of investment on the Indigenous estate resulting from both state and market failure.²⁷ In requiring that Indigenous people make a contribution to the fund and share the commercial risks, the risks of 'adverse selection' and 'moral hazard' would be minimised.²⁸ Risks to both public and private investors would also be minimised with the significant prospect of repayment after an agreed number of years. Direct Indigenous investment into commercial enterprises could also provide a future source of collateral for commercial loans (88).

There are additional opportunities for Indigenous NRM groups to secure funding or income from the private and non-government sectors. The framework report of the Healthy Country Healthy People Schedule²⁹ (HCHPS) in the Northern Territory, released in 2007, recommended that any expansion to

²⁶ There is precedent for such a scheme, with the Innovation Investment Fund (IIF) (administered by the then federal Department of Industry, Tourism and Resources) introduced in 1998 along similar lines. The IIF program is a venture capital scheme that supports commercialisation of innovation by small start-up firms.

²⁷ Commercial banks have been reluctant to lend to Indigenous interests without realisable collateral.

²⁸ Joint ownership of the project might increase the cost of failure and lower potential moral hazard problems. Where Indigenous stakeholders make no financial contribution, adverse selection might result in the enterprises least likely to succeed seeking public and private sector support. Similarly, moral hazard might take the form of limited or low incentive to make an enterprise succeed or to repay loans.

²⁹ When the HCHPS framework was developed it was proposed that government agencies and peak bodies invest in delivering tailored three year investment packages to individual Indigenous land and sea management groups. This was

the WoC program should make additional efforts to encourage Indigenous land and sea management groups to develop fee-for-service contracts and other commercial opportunities so organisations can decrease their reliance on government grants (59).³⁰ In the Northern Territory such fee-for-service activities are a small proportion of formalised NRM (59) but there is potential for growth. There are also opportunities for NRM groups to establish dedicated trusts³¹ to support their activities, as well as growing opportunities to develop partnerships or alliances with Australian and global philanthropic donors and not-for-profit organisations. Where partnerships or funding arrangements are developed with corporate or other investors it is important that Indigenous land and sea management activities continue to be consistent with Indigenous aspirations and concerns rather than being diverted to the agendas of funding agencies requiring specific services (103).

Recognition of Indigenous diversity and the distinctive features of the hybrid economy

The hybrid economy is poorly understood by politicians, policy makers and Indigenous people and their representative organisations alike. Consequently, important Indigenous contributions remain unquantified and unrecognised in mainstream calculations of economic worth. This shortcoming results from inadequate analytical approaches that fail to ask how development based on market engagement alone can be delivered to communities that are extremely remote from markets, in both locational and cultural terms. Key features of the hybrid economy model are its ability to recognise the mix of market and non-market activities through which Indigenous people make their livelihoods; its recognition of the diversity of Indigenous aspirations and activities; and its flexibility in accommodating these differences.

That diversity is a characteristic of Indigenous interests in water and water-dependent resources is not surprising. Indigenous people in northern Australia are spread across urban, regional and remote settlements that range from small homelands/outstations to large cities and towns. Different settlements may have very different histories, governance arrangements and systems of land tenure. In addition, they are spread from the coasts to inland areas and exist on lands with a wide range of geomorphological and hydrological features. Their Indigenous residents have diverse cultural and linguistic traditions, different cultural and social norms and uneven access to employment, health, education and other services. Some have very large land holdings, perhaps geographically encompassing water bodies, while others own no land. While some want to live on country and work as land managers, others want to work in mining, pastoralism, tourism or the arts. Still others want to migrate to areas where there are more opportunities for mainstream employment.

Sound planning and management of water resources in northern Australia will need to accommodate the great diversity of Indigenous aspirations and interests in the region through a flexible and responsive approach. This will require an avoidance of 'one-size-fits-all' policy approaches. It will also require support for regional participatory planning and consensus-building where diverse Indigenous interests on neighbouring lands are incompatible. The flexibility inherent in the hybrid economy

built on the signalled potential release of approximately \$20 million new investment from the Indigenous Land Corporation (ILC) (\$10 million) and the ABA (\$10 million). The ILC has since indicated that it will withdraw from the HCHPS and its share of the funds will be re-allocated to a training package jointly developed with DEEWR to provide training and employment opportunities in pastoralism, tourism, resources industries and ILC businesses.

³⁰ A limit to WoC is that it cannot be used for commercial activities (such as commercial wildlife harvesting) outside of NRM. This limits the opportunities for enterprise development.

³¹ The Karkad-Kandji Trust is currently being established to support the Warddeken and Djelk Indigenous Protected Areas that were declared in late September 2009.

framework, where the size and mix of sectors will vary from place to place, could assist in such planning processes.

4.3 Given these potential opportunities describe the socio-economic impacts

4.3.1 Net economic benefits

The net economic benefits of formalised Indigenous land and sea management include direct benefits to Indigenous workers and communities as well as indirect benefits to other commercial enterprises, the nation and the international community. Direct benefits are included in this section; indirect benefits are highlighted in section 4.3.3.

Direct economic benefits to Indigenous people in northern Australia include job-creation and the establishment of viable commercial enterprises in remote locations where people would otherwise have limited options for productive market participation. As noted above, there are around 500 Indigenous people working in formalised land and sea management in the Northern Territory alone (59). While the Territory hosts the majority of well-established Indigenous NRM programs, there are also a significant number of groups (for example under the Working on Country program) in the north of Western Australia, Cape York and the Torres Strait Islands. Active employment in land and sea management also has a range of important social and cultural benefits.

4.3.2 Social impacts

The establishment of viable commercial enterprises in land and sea management offers Indigenous people an opportunity to fulfil their aspirations to stay on, and care for, country while also engaging in the customary economy and passing on cultural and ecological knowledge to younger generations. There is emerging evidence that natural and cultural resource management improves individual health. For example, Burgess and colleagues' (77, 104) have shown that among their study participants (around 300 Indigenous people in Arnhem Land), participation in natural and cultural resource management activities³² is correlated with reduced risk factors for diabetes and cardiovascular disease resulting from more physical activity and better nutrition. They also suggest that natural and cultural resource management activities can improve physical and psycho-social health by increasing self-esteem, personal autonomy and community cohesion (15).

Formalised NRM activities, when properly resourced, facilitate the development of new skills and capacities that will help rangers to advance their career prospects. For example, the Manwurrk Rangers have used new skills in CyberTracker software to undertake scientific monitoring of feral animal damage to freshwater springs on the Arnhem Plateau (105). In Maningrida, healthy competition for jobs with the Djelk Rangers means that a relatively high level of education (in school-based and on-country learning) is needed to secure a job with the group (83). Across the Northern Territory well-trained CDEP workers have demonstrated capacity to exit to WoC jobs.

³² Burgess and colleagues include landscape burning, customary and commercial wildlife harvesting and participation in ceremony, among other activities, in natural and cultural resource management.

4.3.3 Economic and job multipliers

There is clearly potential to expand employment in the provision of environmental services on the Indigenous estate across northern Australia. There are also possibilities for linking this work to opportunities in the emerging carbon economy (98). A detailed assessment of regional possibilities and local needs in land management activities on the Indigenous estate is required. Some preliminary work on the possibilities for formalised land and sea management in two Indigenous Protected Areas in Arnhem Land is currently underway through the Tropical Rivers and Coastal Knowledge (TRaCK) Sustainable Enterprises research theme, with additional projects also to be undertaken in the Fitzroy Valley, West Kimberley region and in the Archer River catchment on Cape York. Additional research for other areas on the Indigenous estate is urgently required.

Economic multipliers of Indigenous natural resource management result from standard enhanced turnover for community enterprises, like retailing resulting from the additional income earned by Indigenous rangers employed on a salaried basis under the WoC program. Positive economic externalities of Indigenous natural resource management include the benefits of environmental restoration and protection, with the provision of environmental services having clear spinoff benefits for water-dependent industries off the Indigenous estate. For example, efforts to reduce the spread of weeds and feral animals can have significant consequences for stream flows and aquatic ecosystems (including water quality and availability) that are also important to pastoral industries and irrigated agriculture. The impacts of Indigenous caring for country on biodiversity, fire management regimes and greenhouse gas emissions also offer ecological benefits that are in national and global interests and that will become increasingly important in underpinning sustainable economic futures (84).

5. IF THE POTENTIAL OPPORTUNITIES FOR INDIGENOUS ECONOMIC DEVELOPMENT WERE TO OCCUR, WHAT WOULD BE REQUIRED TO MAXIMISE THEIR POSITIVE IMPACTS?

Section 4 has focused on opportunities in Indigenous NRM and identified many of the capital and other needs specific to those activities. However, many of the principles identified (including support for local and regional planning, capital investment and governance support) are applicable to other water-dependent industries where Indigenous people have an economic interest. While a detailed study of these industries is not possible here, this section and the next (section 6) attempt to briefly outline some additional concerns relevant to them.

5.1 Practices

Establish Indigenous aspirations and activities

In planning for northern Australia's water resources there is an urgent need to fund research into the aspirations of individual Indigenous groups and organisations across the region. Indigenous people's aspirations and needs in relation to water planning and management will be diverse. There is also a need to explore possibilities in new and emerging industries such as carbon abatement and sequestration and to assess new ways of sustainably revisiting old industries like forestry on a plantation basis for niche products like sandalwood. As Davis (60) has identified, in making decisions

about economic futures Indigenous people need to consider the complex and ‘fundamental ethical and political question of “how should we live”’. There is a need for institutional support in answering these questions, including adequate resourcing, capacity building and governance support.

Regional planning and communication

Recent research in northern Australia has suggested that Indigenous interests are marginalised in water planning where efforts to engage Indigenous people rely on a ‘representative’ model of stakeholder participation, non-Indigenous modes of interaction and Western scientific knowledge (10). Negotiation and collaborative management will be more effective in recognising and accommodating Indigenous interests in water planning than a limited focus on consultation.

As well as understanding diverse Indigenous aspirations there is a need for planning that identifies and communicates needs at the regional (landscape) scale. Appropriate mechanisms should be developed to ensure the widespread sharing of best practice across Indigenous groups, bearing in mind the need to avoid practices that are monopolistic or uncompetitive. The Indigenous Community Water Facilitators Network (ICWFN) is a clear example here. Opportunities for regionally-based planning also exist in particular industries such as bush foods and wildlife harvesting.

Indigenous Community Water Facilitator Network

The Indigenous Community Water Facilitators Network³³ (ICWFN) project is overseen by the Indigenous Water Policy Group and hosted by the North Australian Indigenous Land and Sea Management Alliance (NAISMA). The project is funded by the National Water Commission until 2011. The ICWFN aims to establish a community-based network to advance Indigenous engagement in research and management in relation to northern Australia’s tropical rivers and water use and conservation; and act as a catalyst to ensure that Indigenous interests are articulated and incorporated into water planning, water allocations and water policy decisions. It also has a communicative role, aiming to promote awareness and understanding of the NWI among Indigenous people; and promote awareness of Indigenous interests, rights and values in water among non-Indigenous stakeholders. The ICWFN also aims to foster collaborative and collegial partnerships between Indigenous people, researchers, governments and other users of land and water resources (including developers, pastoralists and irrigators) (106).

Regional planning can also assist in examining possibilities for more vertical integration so that Indigenous stakeholders are not just exporters of goods and services, but can also value-add locally. For example, Indigenous wildlife enterprises that supply crocodile hatchlings receive greater returns than those just supplying eggs from wild harvest. There may be opportunities for Indigenous enterprises to collaborate to achieve vertical integration through the supply chain.

³³ The six regionally-based Indigenous Community Water Facilitators in the network are located in the Fitzroy and Ord River catchments in Western Australia; the Katherine-Daly catchment in the Northern Territory; the Gregory in the Southern Gulf; and the Mitchell and Wenlock catchments in the Cape York region. The ICWFN coordinator is based in Darwin.

5.2 Infrastructure, services

Remote service delivery and capital funding

Maximising Indigenous economic potential in northern Australia requires enhanced service and telecommunications delivery that recognises both the benefits of a peopled landscape and the undeniable difficulties of delivery to small, extremely remote settlements and enterprises. Service delivery in this context must be both innovative and adequately resourced and will require the application of state-of-the-art technological expertise. Investment is required in housing, education and health services to meet long-standing infrastructure backlogs (107) and address the existing socio-economic disadvantage faced by Indigenous communities and enterprises.

Business incubation and support

The benefits of Indigenous development in water-dependent industries may be maximised through the use of new web-based direct marketing options, regional coordination and better start-up and incubation support for new enterprises. Business incubator services may include support with business training, marketing, technology and telecommunications (especially internet access and mobile phone coverage), the facilitation of networks, assistance in securing grant funding and private contracts, regulatory compliance and financial, administrative and asset management. Support should be given to developing business models that deal effectively with communal ownership and shared rights and obligations. Business support may also include research into demand and markets for the products and services produced by Indigenous enterprises.

5.3 Institutional arrangements, incentives, capital, credit

Institutional arrangements for Indigenous water use and enterprise development must be streamlined, from the clarification of property rights to the provision of appropriate incentives for sustainable development initiatives.

Clarification of rights

Property and access rights to water are central to many opportunities for economic development. Rights regimes and questions of ownership need to be clarified before sustainable development can proceed. For example, Indigenous people may want a reserve of water resources set aside for future commercial use even if they do not intend to engage in commerce in the short term. Emergent tensions with non-Indigenous stakeholders will need to be resolved. The Blue Mud Bay case identified in section 3 is an example of Indigenous rights that pave the way for commercial development of marine resources in the inter-tidal zone.

Commercial implications of the Blue Mud Bay decision

The Blue Mud Bay decision recognises the exclusive access rights of coastal traditional owners to the column of water above the inter-tidal zone. It does not automatically bestow a right to harvest inshore species like barramundi or mud crabs for commercial sale, but leaves room for innovative negotiation to ensure delivery of de facto tradeable commercial rights over marine species to Aboriginal coastal land owners. One can envisage a diverse range of responses including closures of the inter-tidal zone, negotiated access, Indigenous participation across the entire commercial fishing sector and joint-venture partnerships.³⁴ Each of these options can generate economic development opportunity for Aboriginal people: through enhanced employment in sea country management and as sea rangers implementing fisheries regulation in remote regions; through better access to marine resources for livelihood; from financial returns for negotiated access rights; or from opportunities for joint venture or sole operator involvement in commercial fisheries. The likelihood of more sustainable use of marine resources and greater utilisation of Indigenous knowledge alongside western science are enhanced (108).

Incentives

Pecuniary and financial incentives can encourage the sustainable use and management of resources. For example, commercial opportunities in sustainable Indigenous NRM activities could be assisted with a more realistic investment on the Indigenous estate at rates that match investments in national parks and in more densely populated areas (88). Incentives can also include non-financial encouragement and reward. The discourse of Indigenous failure—common among policy-makers, politicians and the Australian public—needs to be replaced by a discourse celebrating Indigenous success where it is demonstrably evident.

6. IF THE POTENTIAL OPPORTUNITIES IN INDIGENOUS LAND AND WATER MANAGEMENT AND CARBON ABATEMENT WERE TO OCCUR, WHAT WOULD BE REQUIRED TO MINIMISE THEIR NEGATIVE IMPACTS?

6.1 Practices

Establish the sustainability of Indigenous economic activity

Research is required in order to establish the sustainability of the various economic activities Indigenous people are engaged in (or aspire to establish) in northern Australia. Any Indigenous proposal should be subject to appropriate environmental assessment. Assessment should occur even where people have rights to unlimited customary use in order that they are fully-informed of environmental impacts when making decisions.

³⁴ Some concerns have been raised that traditional owners might exercise their right to exclude all fishers from the inter-tidal zone. But analogous right of consent (or veto) provisions in the *Aboriginal Land Rights (Northern Territory) Act 1976* with respect to mineral exploration and mining have not seen the widespread exclusion of these activities from Aboriginal-owned land, despite widespread mining industry concerns in the 1970s and 1980s.

Sustainability in an Indigenous context can be a complex question. For example, some land uses that may be ecologically sustainable in a western scientific sense may be criticised by other Indigenous people. Davis (60) has noted Aboriginal peoples' concerns that some Aboriginal-owned pastoral stations provide too few financial benefits to Aboriginal landowners and are therefore an inappropriate use of resources. There may be tensions between what Indigenous people perceive as a sustainable use of resources and environmental protection legislation or animal welfare concerns. The opposition of some Aboriginal leaders to Queensland's Wild Rivers legislation is a case in point. Negotiating between competing interests will always be difficult but positive outcomes are most likely when decision-makers adequately engage with stakeholders and ensure transparency and accountability so that decisions can be effectively scrutinised.

Crocodiles and conservation hunting: Contested values mediated by the state

Since the end of unregulated hunting in 1971, the saltwater crocodile population has recovered from being at risk and is now considered to be abundant in northern Australia. Available data show that the Northern Territory population continues to increase and expand into new and often marginal areas (109). In 2005 the Northern Territory Government released a draft crocodile management plan that proposed allowing the removal of 25 adult crocodiles from NT waters each year by fee-paying hunters (these would have been included in the maximum quota of 600 'problem' crocodiles that could be removed annually). Such hunting is referred to as 'safari' hunting or, more recently, conservation hunting.

After much discussion about cultural relationships with crocodiles, Indigenous landowners supported the idea of conservation hunting. They saw it as an additional economic activity to their crocodile propagation enterprises (collecting crocodile eggs from wetlands, incubating them and on-selling the hatchlings to crocodile farms). Crocodile egg collection has added value to wetlands and increased incentives to protect them, as well as generating income, providing employment and aiding the transfer of ecological knowledge between generations. Conservation hunting was anticipated to add to the commercial use of crocodiles by having fee-paying hunters, guided by Aboriginal land owners, eliminate 'problem' crocodiles. However, despite wide support, the conservation hunting component of the crocodile management plan was rejected by the then federal Minister for the Environment, Ian Campbell, who believed that conservation hunting was inconsistent with a modern day approach to animal welfare and responsible management.³⁵

6.2 Infrastructure, services

Recognise long-term need and chronic underfunding

The provision of much-needed infrastructure and services in Indigenous settlements across northern Australia must avoid short-termism that fails to adequately address Indigenous aspirations and environmental need. For example, facilities should be as carbon neutral and least fossil fuel dependent as possible; housing must be adequately insulated; state support for Indigenous

³⁵ Hansard 2006 *Senate* No. 11, 2006 Thursday, 12 October 2006 Forty-First Parliament First Session—Seventh Period, p 109. It should be noted that the most recent crocodile management plan released by the NT Government has again proposed conservation hunting, this time with a quota of 50 animals per annum (110).

enterprises (whether through payment for services received or the provision of business incubation services) must meet existing unmet infrastructure needs as well as recurrent support for services provided.

6.3 Institutional arrangements, incentives, capital, credit

Avoid negative externalities, moral hazard and adverse selection

Institutional arrangements must operate at the regional or landscape scale in order that diverse Indigenous aspirations do not generate negative externalities (such as for the environment or for neighbouring groups). There is a need to ensure that incentives accord with local Indigenous aspirations and that problems of moral hazard or adverse selection are minimised (for example in decisions about which Indigenous enterprises and activities receive state support) (88).

7. WHAT ARE THE CRITICAL KNOWLEDGE GAPS PREVENTING SOUND ANSWERS TO QUESTIONS 5 & 6?

7.1 Biophysical

Inadequate resource and activity mapping

There is currently too little resource atlas mapping at local scales across the Indigenous estate.³⁶ Inventories of available resources (such as surface and ground water) are inadequate. Local-level studies are required that can build on TRaCK's current Sustainable Enterprises research and identify what is needed to ensure the maintenance of environmental integrity while there is commercial development on the Indigenous estate.

7.2 Economic

Inadequate investment knowledge

There are significant knowledge gaps about what investments are currently being made to support Indigenous enterprise development across northern Australia, so it is far from clear if such investments are being made on an equitable needs basis. From a public policy perspective it is important to consider that additional investments are likely to reap high public benefits from a reduction in Indigenous disadvantage. This is especially so because rapid Indigenous population growth is likely to exacerbate the direct and indirect costs to the nation of enhanced future disadvantage without appropriate investments today. From a national perspective, climatic and global resource uncertainty might also justify enhanced investment in Indigenous natural resource

³⁶ In 2004 the Northern Land Council (NLC) released 'Environmental Management Status Reports' for river basins on Aboriginal land in the NLC region (111). While a very useful beginning, further work is needed to update these reports and extend reporting across the north.

management that will reduce risks associated with biodiversity loss and enhance north Australian contributions to global environmental goals.

Inadequate data on Indigenous customary and commercial water uses

More research and better data are needed to establish the range and extent of commercial and customary uses of water that Indigenous people currently engage in. For example, a recent scoping study of the allocations of water licenses and entitlements to identified Indigenous businesses for commercial purposes found that agencies issuing water licenses or administering Indigenous-specific business support programs had little knowledge about Indigenous commercial water users. In the absence of an administrative Indigenous identifier in water licence databases it is difficult to know how many Indigenous businesses are using water commercially or for what purposes (35). The limited data on Indigenous participation in fishing and hunting identified earlier in this chapter could be usefully supplemented with more detailed, local-level studies that examine the local significance of customary uses of natural resources.

Indigenous values and river flows research project

One example of a study on the social and economic significance of natural resources for Indigenous communities is the 'Indigenous values and river flows' project that is currently being undertaken by CSIRO. The project is auspiced by the TRaCK hub. It seeks to: improve understanding of the social and economic significance of water, rivers and wild resources to Indigenous people in the Daly (NT) and Fitzroy (WA) catchments; provide systematic and comprehensive assessment of Indigenous values related to flow and impacts of change in flow regimes; test methods to assess, incorporate and monitor Indigenous values in water planning; ensure Indigenous participation in a trial monitoring program for flow regime change and wild resources use; and ensure collaborations enhance the capacity of researchers, Indigenous communities and managers in water allocation decisions and planning that incorporate Indigenous values. It will attempt to quantify the economic benefits that Indigenous households derive from using aquatic resources (112). Some early outputs from the project are already available (113, 114).

7.3 Social

Inadequate knowledge of Indigenous aspirations

As noted above, sustainable water planning requires that more is known about Indigenous aspirations and the capacity for these to be realised. The approach to development in northern Australia needs to be retooled recognising that Indigenous aspirations extend beyond the mainstream. Using the hybrid economy framework with its three sectors and seven segments as a template, a wider range of economic development possibilities can be identified that might assist groups that have not as yet been empowered with adequate access to information about the suite of opportunities already available. This information can underpin participatory planning by Indigenous groups as they build bottom-up development models.

8. SUMMARY

8.1 Why is it critical to consider the role of Indigenous land and water interests in the development of northern Australia?

It is critical to consider Indigenous land and water interests in the economic futures of northern Australia because the past alienation of lands and water has contributed to significant socioeconomic marginalisation. There is a need to learn from the political mistakes of the past. A significant estate has now been returned to Aboriginal interests with some expectation that this will facilitate improvement in socioeconomic outcomes. 'Closing the Gap' on Indigenous disadvantage will require forms of affirmative action to ensure restitution of opportunity predicated on equitable access to land, water and resources. This is especially important because population projections indicate that the Indigenous population is growing rapidly and will comprise more than a third of the population of northern Australia in just over ten years.

Indigenous people have specific (unique) rights as Indigenous people that are recognised in international instruments endorsed by the Australian government. These instruments are clear in detailing Indigenous peoples' rights to determine their own development priorities and be active participants in development planning. The NWI explicitly requires the recognition of Indigenous needs in water access and management. It is up to the federal, state and territory governments to put these commitments into practice.

8.2 What is the current status of the role of Indigenous land and water interests in the development of northern Australia?

Indigenous people have strong economic, cultural, social and environmental interests in land and water in northern Australia. However, Indigenous commercial interests remain inadequately acknowledged and underdeveloped. There is a need to ramp up state enabling of the Indigenous utilisation of land and water resources across all sectors of the hybrid economy. Arguably, Indigenous livelihoods can be improved by increasing the size of all three sectors, with the proviso that passive welfare from the state is unlikely to drive improved wellbeing. In some circumstances income support from flexible workfare, like the CDEP program that the Australian government is currently winding down, might be of assistance.

8.3 Is this sustainable?

Sustainability for Indigenous enterprises will need to be assessed on an industry-by-industry, sector-by-sector and region-by-region basis as there is enormous biophysical, economic and social variation in northern Australia. It cannot be assumed that all Indigenous production, even in the customary sector, is sustainable. However, indications to date suggest that there is considerable capacity for enhanced utilisation of some natural resources (such as timber for art production or small-scale wildlife enterprises). On the services side, it is difficult to imagine an oversupply of environmental services, although from a public sector funding perspective diminishing returns to investment may set in.

8.4 What are the likely future pressures or trajectories?

Future pressures may emerge from Indigenous adoption of unsustainable enterprises but these will be minimised by subjecting proposals to appropriate environmental assessment. Significant pressures are likely to arise from the predicted impacts of climate change. The over-allocation of water licenses to non-Indigenous users and/or environmental degradation caused by industrial and agricultural developments in northern Australia will negatively impact on Indigenous livelihoods and economic development options.

8.5 What are the 5 key points that will help delivery of sustainable benefit from Indigenous land and water uses?

1. Recognise the legitimate interests of Indigenous stakeholders, especially land holders and land-linked people, in the land and water resources of the north. Indigenous people own around 30 per cent of the northern Australian landmass and constitute close to a third of the region's population. The commitment to Indigenous representation in the NWI must be properly resourced to assist Indigenous people to establish their own objectives and have a real and decisive influence in decision-making. This will include building capacities/capabilities and strengthening institutions. There is also a need to build cooperative planning and water management instruments between Indigenous groups at a regional (landscape) scale.
2. Recognise Indigenous rights to water resources through legal regimes. Water rights in northern Australia remain contestable and from an Indigenous perspective there are legitimate calls for social justice repatriation of alienated resources. Indigenous rights to water (access and/or property rights) are central to Indigenous livelihoods and are a valuable tool in 'Closing the Gap' on Indigenous disadvantage. Possible tensions between commercial allocations and Indigenous people's statutory customary use rights under S211 of the *Native Title Act 1993* (NTA) need to be recognised and ameliorated.
3. Recognise the diversity of Indigenous circumstances and aspirations. The hybrid economy framework can help to identify current and potential opportunities for Indigenous economic development in the market and customary sectors as well as opportunities for state support. Targeted resources are required for detailed studies that identify Indigenous peoples' needs and aspirations in water-dependent industries and establish the potential for sustainable expansion of these activities. The diversity of Indigenous economic activities and interests need to be recognised and accommodated in water planning.
4. Recognise the value of Indigenous economic contributions at local, regional and national levels and ensure equitable remuneration and necessary state support. Investment is urgently required to meet capital needs and facilitate effective and sustainable business planning. Business incubation services are needed in order to enable opportunities that are responsive to local aspirations, particularly in areas with comparative advantage and that can be demonstrated to work. Indigenous people have a clear comparative advantage in distinct economic niches on the large Indigenous-owned estate. These include provision of environmental services, carbon abatement, tourism, arts production and wildlife and bush

foods enterprises. These industries offer clear opportunities for Indigenous economic development that meets Indigenous aspirations to stay on, and care for, country.

5. Recognise the distinct risks of over-development and climate change for Indigenous people. The hybrid economy is heavily reliant on natural resources. Indigenous livelihoods (customary and commercial) may be adversely affected by the development or expansion of water-dependent industries that impact on flows, generate pollution or accelerate the spread of invasive species. These risks are likely to be exacerbated by the predicted effects of climate change and climate forecasts should be taken into account in water planning.

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APPENDIX: METHODOLOGY FOR POPULATION PROJECTIONS OF NORTHERN AUSTRALIA

The underlying methodology for population projections used in this chapter involves applying estimates of particular components of the following demographic identity:

$$\begin{aligned} Pop_{t+\Delta} = & Pop_t + Births_{t,t+\Delta} - Deaths_{t,t+\Delta} + (immigration_{t,t+\Delta} - emigration_{t,t+\Delta}) \\ & + (immigration_{t,t+\Delta} - outmigration_{t,t+\Delta}) \end{aligned} \quad (1)$$

At the national level, the Indigenous population at a particular point in time in the future (t+Δ) is equal to the population at a previous point in time (t), plus births to Indigenous mothers and births to non-Indigenous mothers and Indigenous fathers that occurred over the period, minus Indigenous deaths, plus international net migration. As the projections undertaken for this chapter are for a particular geographic region, net internal migration should also be added.

The above components of population change result in projections by five year age cohorts (up until the population 65 years and over, who are grouped together) for Indigenous and non-Indigenous males and females separately. The assumptions used for each of the components of the above demographic equation are outlined below.

Area boundaries :

The first step in undertaking population projections is to identify the boundaries of the given region. This is based on an approximation of drainage regions using ABS Statistical Local Areas (SLAs). Projections are made for each SLA in Australia separately which are then summed to create estimates for two regions, Northern Australia and the Rest of Australia.

Base population (Pop_t):

The base year for the projections was 2006. As the ABS does not produce Estimated Resident Populations (ERPs) for specific age groups for SLAs it was necessary to create base populations using the population counts from the 2006 Census. These were adjusted using the implied undercount in the SLA which is calculated by dividing the SLA ERP by the SLA all-age population count.

Fertility and projected births (Births_{t,t+Δ}):

There are two types of births that need to be estimated. The first of these is births of Indigenous children to Indigenous mothers. These are calculated for each five year age group from age 15 to 19 through to age 45 to 49 based on state-specific fertility estimates from 2005, 2006 and 2007. The second type of births is those of Indigenous children to non-Indigenous mothers. These births are estimated by taking an average of a fertility and paternity rate. The fertility rate is calculated by the same five year age groups for non-Indigenous females by taking the births of Indigenous children to Indigenous mothers away from the total number of Indigenous births at the state level and dividing by the non-Indigenous female ERP. The paternity rate is calculated by using the same number of births but dividing by the Indigenous male ERP. For SLAs in the Australian Capital Territory, New South Wales rates are used. Indigenous births (to Indigenous and non-Indigenous mothers), were allocated using a masculinity ratio of 50.4 to reflect the national Census counts for those aged 0 to 4 years.

Mortality and projected deaths (Deaths_{t,t+Δ}):

Balancing to a certain extent the births that are projected to occur are those who die over the same period. The proportion of each five year age group who die over a given period is calculated using the latest state-specific life tables. For those SLAs in Victoria, Tasmania and the Australian Capital Territory, New South Wales rates are used, whereas for those areas in South Australia, Western Australian rates are used.

Net overseas migration ($immigration_{t,t+\Delta} - emigration_{t,t+\Delta}$):

While there will be some Indigenous Australians who emigrate and some who return to Australia each year, the net effect on the population is likely to be negligible. Furthermore, there is no Indigenous identifier on passenger arrival or departure cards. For these reasons, all those who enter Australia are assumed to be non-Indigenous.

Net internal migration ($inmigration_{t,t+\Delta} - outmigration_{t,t+\Delta}$):

The projections assume that the same rate of net internal migration that occurred between 2001 and 2006 will be replicated for each of the subsequent five year intervals. The same rate of net migration is assumed for each SLA in Northern Australia and the Rest of Australia and are calculated separately for the relevant 5 year age groups.

Results :

Table A1 Population estimates and projections, Indigenous and non-Indigenous males and females, 2006 to 2031, 5-yearly intervals.

	2006	2011	2016	2021	2026	2031
Northern Australia						
Indigenous males	41,714	44,345	47,487	50,598	53,562	56,367
Indigenous females	42,890	45,696	49,033	52,364	55,567	58,605
Non-Indigenous males	101,015	103,074	104,018	104,013	103,339	102,221
Non-Indigenous females	90,969	94,770	97,536	99,416	100,532	100,997
Rest of Australia						
Indigenous males	207,994	232,338	260,251	290,876	322,864	355,661
Indigenous females	214,876	239,611	267,998	299,140	331,668	364,972
Non-Indigenous males	9,712,538	10,369,27	10,970,01	11,512,63	11,994,87	12,406,92
Non-Indigenous females	10,061,01	10,716,83	11,324,85	11,877,92	12,368,57	12,784,09
	9	8	1	5	0	7

[Source: Prepared by Nick Biddle from Australian Bureau of Statistics data].