

Freshwater customary harvesting practices and climate change adaptation in the Alligator Rivers region, NT

Science summary

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This PhD research sought Aboriginal people's perspectives on changes to floodplain country and freshwater resource use. It examined the major drivers of change and adaptive responses in freshwater customary harvesting practices. This research highlights ways in which the strengths and adaptive abilities associated with Aboriginal biocultural knowledge and practices can be supported, given the anticipated impacts from climate change.

BACKGROUND

Around the world, coastal communities reliant on freshwater resources are navigating the growing impacts of anthropogenic climate change. For communities already subject to marginalising forces of remoteness, poverty and the legacies of colonisation, climate change impacts will likely add to existing stressors.

The coastal, freshwater wetlands of Kakadu National Park and West Arnhem Land are at risk from increasing saltwater inundation from sea level rise, as well as from existing environmental threats. These wetlands support the ongoing engagement of Aboriginal people with freshwater country. An important expression of this relationship is through customary harvesting – the hunting, fishing, gathering and management of freshwater resources.

This research sought Aboriginal people's perspectives on changes to floodplain country and freshwater resource use. It examined the major drivers of change and adaptive responses

in freshwater customary harvesting practices, in living memory. Emma's inquiries drew on people's experiences and perceptions of environmental and social changes shaping these practices, to find ways of supporting ongoing freshwater customary harvesting practices. This was to assist in the development of locally meaningful strategies to sustain biocultural practices and manage future environmental change. She worked primarily with Traditional Owners from estates across the floodplains and freshwater wetlands of the South and East Alligator Rivers.

Emma drew on historical and geographical research approaches. She carried out semi-directed interviews, cultural resource mapping and archival work. Emma shared many trips on country with Traditional Owners and Aboriginal rangers. This was to both understand contemporary harvesting practices and observe firsthand places that people were concerned about, or that had changed substantially in recent years.

KEY ENVIRONMENTAL PRESSURES INFLUENCING FRESHWATER CUSTOMARY HARVESTING PRACTICES

Feral water buffalo, pigs and cane toads

The big environmental stories influencing freshwater customary harvesting included the arrival of introduced animal species like the cane toad, feral pig and Asian water buffalo. The history of pigs and water buffalo in the region with colonisation had seen both



Harvesting waterlily seed heads (left) and freshwater mussels, photo Emma Ligtermoet.

people and floodplain adapt to their presence. Respondents consistently raised, however, the threat of their dangerous presence as deterring access (particularly for women and children) as well as damaging freshwater places and food resources such as Northern long-necked turtles (*Chelodina rugosa*) and water chestnuts (*Eleocharis dulcis*). More recently, the cane toad's rapid and devastating impact on the abundance of floodplain goanna (*Varanus panoptes*) has, to date, effectively ended the customary harvest of this freshwater species. The loss of this practice was consistently reported as having heavy social, emotional and cultural costs.

Saltwater crocodiles

The dramatic 'bust then boom' in the number of saltwater crocodiles (*Crocodylus porosus*), or gingas, was a very big story affecting people's freshwater harvesting. The commercial crocodile skin trade (1940s–1960s) devastated saltwater crocodile populations – however, following protection in 1971 (NT), they have since made a full recovery. The increased numbers, along with changes in crocodile population structure and behaviour, and in people's biocultural knowledge associated with crocodile management, has increased the risks inherent in living alongside these predators. Now wading for food resources in the water is severely restricted, impacting



Historical saltwater intrusion arising from buffalo impacts on the South Alligator floodplain, Kakadu National Park, 1980 (top). One of many experimental barrages trialled to restore the freshwater wetlands (1979). Source: David Lindner.

particularly on women's harvesting of aquatic plants, freshwater mussels and Arafura filesnake. Fishing practices for men and women are also now restricted to the bank. Trapping fish by wading with walabi nets, as recalled by the middle aged generation in their youth, can now rarely be done.

Invasive weeds

Invasive floodplain weeds expanded rapidly with the removal of buffalo grazing pressure and also represented a big story of environmental change. In particular, para grass (*Urochloa mutica*) and mimosa (*Mimosa pigra*) (in West Arnhem Land), along with the aquatic weed salvinia (*Salvinia molesta*) were most frequently raised as of concern. They have restricted access to freshwater resources, impacted people's safety and reduced the abundance of resources and health of the floodplain and aquatic environments.

Respondents' perception of the threat posed by salvinia and mimosa were universally negative. People's perception of threat posed by para grass, however, did vary among respondents from Gunbalanya, where there is a long history of valued pastoralism and para grass is used as pasture. The interactive impacts of para grass with fire was described as increasing the risk associated with floodplain burning practices. This in particular made women's floodplain turtle hunting practices more difficult. Managing floodplains for multiple livelihoods like pastoralism, conservation and customary harvesting remains a challenge. Mainstream floodplain livelihoods present both opportunities and constraints for supporting the persistence and adaptive capacity of customary harvesting.

Saltwater intrusion

Past experiences of responding to saltwater intrusion arising from feral water buffalo impacts in Kakadu were examined, as a historical analogue for future sea level rise. This research outlined the history of restoring freshwater wetlands through experimental earthen barrages in Kakadu (1970s–2004). The successes of this story demonstrated the strengths in combining both local Aboriginal and non-Aboriginal knowledge. These past experiences were shown to influence respondents' contemporary perceptions of risk and preferences for managing future sea level rise.

Unfortunately resourcing has not supported ongoing monitoring and experiential learning of saltwater influences on floodplain dynamics. Small-scale experimental learning opportunities remain a preferred adaptive strategy, particularly where monitoring can be locally led by Aboriginal land owners and rangers.

KEY SOCIAL DETERMINANTS INFLUENCING FRESHWATER CUSTOMARY HARVESTING PRACTICES AND SUPPORTING ADAPTIVE ABILITIES

- Access and ease of movement on country: Particularly supported through on-country employment and the maintenance of outstations.
- Strong social relations: Facilitates access to country and knowledge sharing. Particularly important between clans of fresh or saltwater estates (or those covering both) and between cross-cultural working partnerships.
- Aboriginal health and well-being: Recognising the integral role of continued access to bush food resources, country and culture in supporting this.
- Effective inter-generational knowledge sharing: Supported through facilitating access to country, shared trips between children and old people, further integration of biocultural knowledge into school activities.



Traditional Owner Connie Nayinggul catching saratoga, West Arnhem Land, photo Emma Ligtermoet.



Floodplain burning during turtle hunting, photo Emma Ligtermoet.

STRATEGIES TO SUPPORT ABORIGINAL PEOPLE'S ONGOING FRESHWATER CUSTOMARY HARVESTING PRACTICES

- Understanding historical legacies influencing contemporary adaptive planning: Considering trajectories of social and ecological change, including recognising the ongoing legacies of colonisation.
- Recognising diversity: Harvesting is a gendered practice, where men and women may experience changes to country differently. A gendered analysis of climate change impacts and adaptive capacity is important.
- Sufficient resourcing and policy consistency in natural and cultural resource management: Necessary to address existing social stressors and environmental threats.
- Foster knowledge collaborations: To support biocultural knowledge sharing and the co-production of environmental knowledge to support climate adaptation (between Aboriginal clans and ranger groups and between Aboriginal and non-Aboriginal partners).
- Facilitate a social learning environment: Particularly crucial in the joint-management protected area context of Kakadu National Park, to support local experimental learning, Aboriginal autonomy and leadership.

Most importantly, incorporating local Aboriginal knowledge, values, perceptions of change and risk, into locally developed climate adaptation strategies will assist in developing equitable, sustainable adaptation pathways.

CUSTOMARY HARVESTING PROVIDES OPPORTUNITIES TO SUPPORT EMPLOYMENT ON-COUNTRY

- Applying expert knowledge of country in the management and monitoring of environmental pressures (feral animals, invasive weeds, saltwater influence on floodplain dynamics) through employment as rangers or fee-for-service payments for clan-based ranger groups.
- Supporting sustainable saltwater crocodile egg harvesting (in West Arnhem Land).
- Through other co-benefits, for example the knowledge and practices associated with customary harvesting offer unique, culturally relevant opportunities to improve remote Aboriginal development outcomes across diverse sectors including health and education.



Traditional Owner Adrian Gumurdul pointing out saltwater intrusion concerns and channel change, West Arnhem Land, photo Emma Ligtermoet.

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Further information

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This factsheet and more information are available from www.nespnorthern.edu.au/projects/nerp/managing-threats-to-floodplain-biodiversity-and-indigenous-values



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