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Unrealised economic opportunities in remote Indigenous communities: Case studies from northern Australia

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ABSTRACT

Building on unique Indigenous advantages for people living in remote areas, this study offers insights for innovative land-based economic opportunities across northern Australia. These advantages—outside the mainstream economics—include peoples' abilities to manage land and knowledge of ecosystems, culture, traditions/ceremonies which directly contribute towards peoples' health, social relations, provisioning of a safe and secure environment, and learning constituents of well-being. To demonstrate, two representative remote communities, Maningrida and Borroloola in the Northern Territory, are used for revealing uncaptured, but valid, opportunities which, if realized, could help enhance Indigenous well-being—a much-needed agenda for the Australian Government. Moreover, innovative land-based opportunities will potentially save ~\$49million/yr of government's welfare costs. This study offers a detailed analysis of the existing socio-economic situation of the selected communities, outlines potential land-based economic opportunities, and advocates for a shift in policy planning from viewing remote communities as a problem to realising advantages of their unique prospects to develop the north. Applying an integrated approach to Indigenous development for supporting new economies can lead to diversification of north's land sector which to date has been predominantly used for beef production causing threats to fragile ecosystems and hence their services to people living in the area.

1. Introduction

Northern Australia, a region of approximately 2.77 m km² area above the tropic of Capricorn, supports more than 200 Indigenous communities, each comprising >100 people. Currently, Indigenous peoples have land rights to approximately 80% of that total land area, either under freehold or joint title arrangements such as Native Title or Indigenous Land Use Agreements (Fig. 1). For Indigenous peoples, land is widely acknowledged as key to defining peoples' identity, social relations, health, cultural aspirations and responsibilities (Archer et al., 2019; Dodson & McCarthy, 2005). However, its role in Indigenous public policies for the wide range of services and benefits which are largely non-monetary, has been ignored to date as evident from the main government strategies i.e. 'Closing the Gap' funded by the Commonwealth of Australia (CoA, 2018; 2020) since 2008, and well-being indicators being implemented for Indigenous peoples by the Australia Bureau of Statistics (ABS, 2001 & 2012–13).

The indigenous estate is not only a biophysical asset of land and water

systems but affords significantly imbued Indigenous socio-economic and cultural values and support the traditional systems of peoples' knowledges and skills (Altman et al., 2011; Sangha et al., 2017). The land systems comprise natural assets such as vast and pristine savannas and associated freshwater and marine systems (Woinarski et al., 2007), and together with Indigenous knowledges, socio-economic and cultural values these systems deliver a wide range of benefits to people (called ecosystem services) which are largely beyond market measures. Recognizing and valuing these assets and their services applying unconventional economic approaches is essential to appropriately inform the Australian Government's Indigenous development strategies, particularly the recent 'Developing the North' agenda (Commonwealth of Australia (CoA) 2015).

The 'Developing the North' agenda, proposed in 2015, focuses on making northern Australia an economic powerhouse through expanding agricultural (especially, pastoral and cropping), mining, and tourism sectors, by applying economies of scale models of production. The agenda follows a typical utilitarian, mainstream economics approach to

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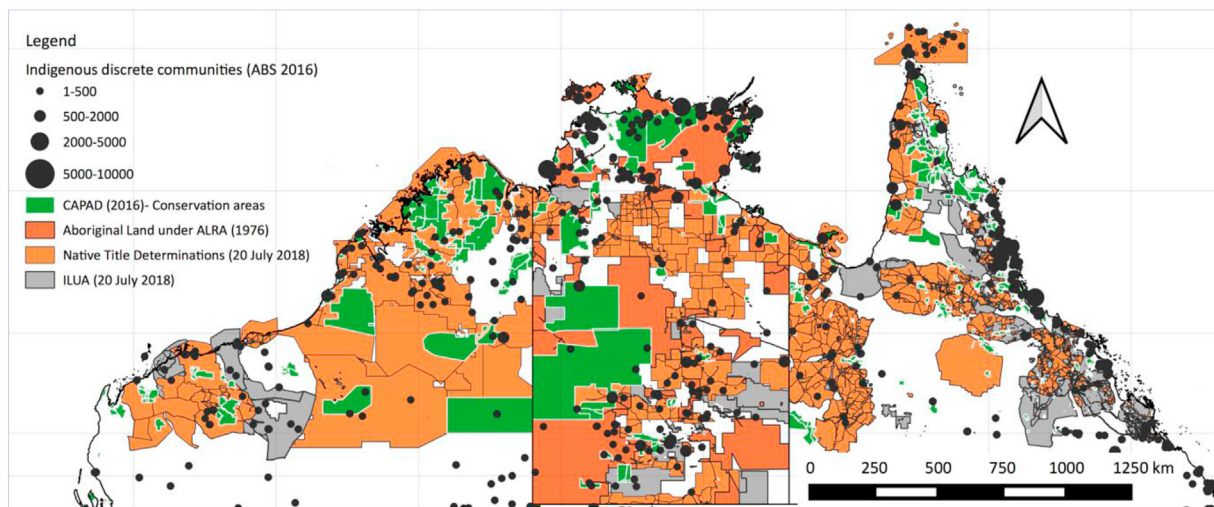


Fig. 1. Conservation estate in northern Australia under CAPAD (Collaborative Australian Protected Area Database 2016), Aboriginal land under Aboriginal Land Rights (Northern Territory) Act (1976), Native Titles determinations and Indigenous Land Use Agreements as on July 20, 2019, and distribution of discrete Indigenous communities.

extract resources through mining and/or exploit resources through agriculture to enhance outputs and exports mainly for the Asia-Pacific region. There is little appreciation for local geography including soil and water resources; the value of unique natural and cultural assets, and related alternative economies; and Indigenous peoples' knowledge, aspirations and rights to land (for details see a critique by Chambers et al., 2018; Russell-Smith, James, et al., 2019).

As of 2019, a significant proportion of the region (~80%) comprises legally recognised Indigenous interests in land, most of which is under Native Title, Aboriginal Land Rights Act (ALRA 1976) and Indigenous Land Use Agreement (ILUA) arrangements that recognise peoples' ongoing affiliation with their traditional estates (Fig. 1). However, the current legal arrangements offer limited economic property rights or control to develop land for the local Indigenous peoples. Most of the Indigenous estate in the north to date has experienced little large-scale disturbance (e.g. introduction of exotic species to develop pasture or crop systems) and development, in contrast to southern Australia; hence the region continues to maintain internationally significant conservation values (Woinarski et al., 2007; Russell-Smith & Sangha, 2018). The formal conservation estate (e.g. National Parks, Nature Reserves, Indigenous Protected Areas, etc.) comprises 20% of the total area (~0.5 m km²) (Fig. 1). Under the current high rates of natural resource degradation, loss of biodiversity and unprecedented rate of climate change across the globe (Intergovernmental Platform on Biodiversity and Ecosystem Services [IPBES] 2019), the north Australian landscape offers unique opportunities for innovative land sector-based enterprises for local, regional and global markets, as illustrated in this paper (Chambers et al., 2018; Russell-Smith, James, et al., 2019).

Despite being land-rich, remote Indigenous people of northern Australia generally live under challenging socio-economic circumstances i.e.: low income, poor housing, health and educational services as evident from Government's 'Closing the Gap' reports (CoA, 2017; 2018; 2020). Such conditions persist despite an average government expenditure of ~\$30 billion per year since 2008, on provisioning basic services as mentioned above (Steering Committee for the Review of Government Service Provision [SCRGSP] 2017). This sustained socio-economic situation raises a critical question about the appropriateness and sector-based targeted method of government spending for supporting remote communities; suggesting effective alternatives that include Indigenous aspirations and values are warranted.

Emerging economic opportunities to develop local Indigenous land sector businesses include eco-tourism, carbon and ecosystem services, and natural resource management which also meet Indigenous

aspirations (Russell-Smith, James, et al., 2019). Collectively, both conservation and Indigenous estates, occupying an area of >2m km² in Australia, afford real economic opportunities, provided there are appropriate policy instruments. However, the current conventional economic development models, as applied by the Australian Government (2015), largely fail to consider any of such opportunities and Indigenous peoples' aspirations (Archer et al., 2019; Russell-Smith & Sangha, 2018). Effectively, prevailing development models and strategies regard the Indigenous estate and its associated remoteness as an impediment to the future development of the north (Chambers et al., 2018; Gerritsen et al., 2019; Morrison et al., 2019)—a view that we challenge in this paper.

We contend that Indigenous disadvantages need to be addressed utilizing culturally appropriate economic approaches, requiring a refresh vision. For example, the savanna burning carbon economy, worth \$20-\$30million per annum (Russell-Smith & Sangha, 2018), supports 27 Indigenous owned and managed land-based enterprises across the region above the 600 mm rainfall isohyet (as on October 2020 using Emission Reduction website: ERF/project-and-contracts-registers" title = "<http://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers>"><http://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers>). Besides, the carbon economy affords peoples' socio-cultural and traditional values (Concu, 2011; Sangha & Russell-Smith, 2017). Another opportunity concerns the 'Working on Country' (WoC) program funded by the Australian Government offering land- and sea-sector based employment (full-time equivalent) for >650 rangers from regional remote communities (with 839 full-time positions across Australia as reported on September 30, 2018 by the National Indigenous Australians Agency, 2020a). Such opportunities further trigger several other small-scale enterprises and cultural activities in the region.

This paper explores the potential for developing unconventional opportunities to promote sustainable, inclusive and innovative development of northern Australia by acknowledging and harnessing Indigenous cultural strengths, capabilities and knowledges to take care of the Indigenous estate, applying a framework proposed by Sangha and Russell-Smith (2017). We consider two remote communities in the Northern Territory (NT) as representative case studies, and examine their current socio-economic conditions, governance structures and related policy issues, and land sector-based existing and future economic opportunities. This study describes how currently 'disadvantaged' communities might transform into fulcrums of a sustainable economy that will benefit not only local but also broader regional communities.

The study acknowledges the framework provided by the United

Nations Declaration on the Rights of Indigenous Peoples (UNDRIP 2007), Article 23 that states “Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development”, and Article 3 stating “Indigenous peoples have the right to self-determination. Under that right they freely determine their political status and freely pursue their economic, social and cultural development”. Moreover, it addresses eight out of the total 17 UN Sustainable Development Goals i.e.: good health and well-being, quality education, decent work and economic growth, reduced inequalities, climate action, life below water, and on land, and partnerships for the goals. Offering suitable economic opportunities will advance Indigenous peoples’ development in ways that they want and will help in recognizing indigenous knowledges, cultures and traditional practices that contribute to sustainable and equitable development, as well as improved management of the environment.

2. Case studies from the Northern Territory, Australia

Two Indigenous towns, Borroloola in the NT Gulf, and Maningrida in the NT’s Top End, located ~900 km and 500 km away from the capital city, Darwin, respectively, were selected for this study (Fig. 2). Both represent typical remote community situations in northern Australia. The region experiences a monsoonal tropical climate, with >800 mm annual rainfall along with frequent storms and cyclones from October until March (the ‘wet’ season receiving >90% of the annual rainfall), followed by an extended dry season from April until September/October. Fires, both managed or more commonly unmanaged wildfires, occur over extensive areas especially the latter in late dry season months (September–November) under deteriorating fire-weather (fully cured fuels, low humidity, and windy) conditions. Vegetation is mostly unmodified under predominant pastoral land use, comprising mostly eucalypt woodlands with limited areas of open grasslands on relatively fertile, fine-textured soils.

Historically, different Indigenous clans from local and surrounding areas were settled in these towns, established as ‘welfare depots’ by the government to colonise, contain, train and assimilate Aboriginal people into the Western ways. In the process of colonisation, many people lost access and rights to their lands. In the late 1980–90s, people in both the selected towns (and a majority across the NT) have retained access to their clan estate lands, which are now registered as Aboriginal Land

Trusts (ALT) under the Aboriginal Land Rights Act (1976). In essence, these clan lands are inalienable freehold (non-transferable) but the statutory authority remains with the Northern and Central Land Councils. Hence, Indigenous peoples hold only limited rights to develop land or change existing lease conditions.

Borroloola township supports 870 people (Australian Bureau of Statistic [ABS] 2016 census) largely from Garawa, Gudanji, Marra, Yanyuwa and Waanyi clans, each with their respective Indigenous estates on which people used to depend for living in the past (Fig. 2). Depending on clan, these estates are now broadly bundled under the Narwinbi ALT (1,350 km²), Garawa ALT (5,200 km²) and Waanyi-Garawa ALT (~11,000 km² area), and afford peoples’ ongoing socio-cultural relationships. Importantly, all these land trusts are of significant conservation value with part of the Narwinbi ALT and Sir Edward Pellew Islands, and entire Waanyi-Garawa ALT listed as Indigenous Protected Areas (IPA) in 2012 and 2016, respectively. The Narwinbi ALT, including the IPA, is managed by the Li-anthawirriyarra rangers, and the Garawa and Waanyi-Garawa ALTs are managed by the Waanyi/Garawa rangers. Indigenous peoples also have Native Title rights to several adjoining pastoral properties in the region.

Maningrida township supports 2600 people (ABS 2016 census) on the Kunibidji clan estate, in addition to people from Ndjebbana, Burarra, Kunwinjku, Rembarnga and Wulaki, Djinang and other language groups, making it one of the culturally and linguistically most diverse communities in remote Australia. People have access to inalienable freehold land, the Arnhem Land ALT under ALRA (1976), which covers about 90,000 km². The ALT supports a few IPAs including Djelk, Warddeken, Marthakal, and South-East Arnhem Land (Fig. 2). The Djelk IPA, proximal to Maningrida, is largely managed by the Djelk Rangers (2019). The region also supports unique cultural businesses, languages and traditions.

Both communities are located in relatively pristine natural environments with negligible agricultural or industrial development. However, there is a substantial mining activity at about 60 kms from Borroloola on non-Aboriginal land, i.e. the McArthur River Mine. Another mine at about 260 km from Maningrida i.e. the Ranger Mine for uranium extraction in Jabiru, established in the 1980s, is now under closing process (expected to be closed by January 2021). These mines have been impacting the Indigenous communities in various socio-economic,

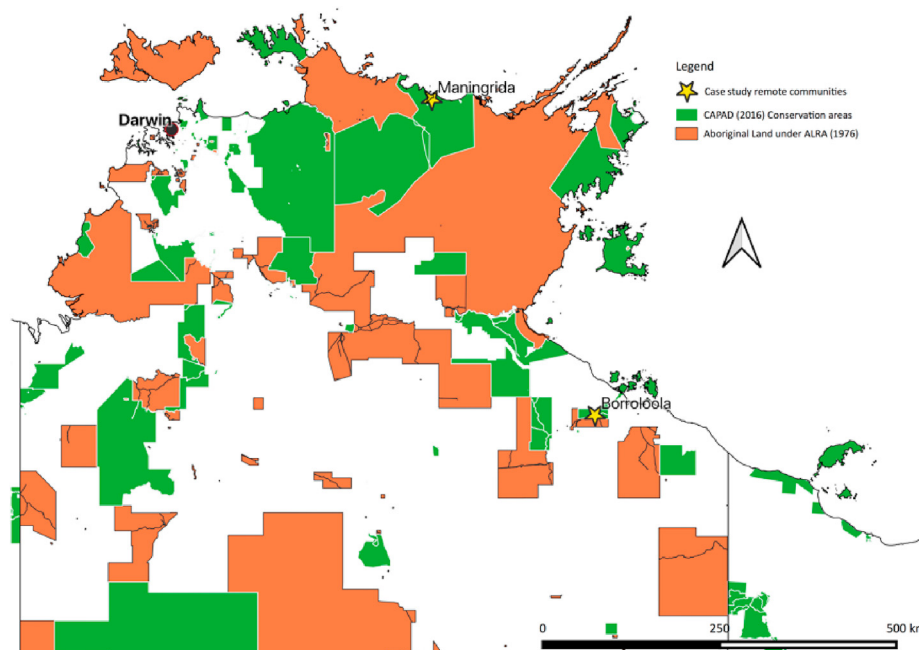


Fig. 2. Location of selected case studies, Maningrida and Borroloola, ALTs, and the adjoining protected areas (IPAs).

cultural and environmental ways, as discussed later. Otherwise, the Aboriginal lands in Borroloola and Maningrida, especially under the IPAs, are known for their natural values i.e. unique biodiversity and landscape features, and sacred and ceremonial values (National Indigenous Australians Agency, 2020b).

3. Socio-economic situation

A presumed fundamental description of success for various Indigenous Australian government programs is to demonstrate equivalence in socio-economic indicators between Indigenous and non-Indigenous populations (e.g. employment, income, life expectancy, education, etc.)—see for example ‘Closing the Gap’ targets (CoA, 2018; 2020). This view reflects contemporary non-Indigenous expectations without consideration of Indigenous aspirations (Taylor, 2008; Sangha et al. 2015a, 2019a; Bielefeld, 2014). However, such a single-minded view poses significant implications for Indigenous welfare and public policies, and subsequently for allocation of funds to related programs.

Currently, the national-scale socio-economic indicators suggest that Indigenous peoples lag behind non-Indigenous people for key well-being attributes in health, education, employment, etc. (Table 1). To address the ‘gap’, current government policies exclusively focus on funding individual sectors such as health or education, and miss the linkages between them (Sangha, Russell-Smith, & Gerritsen, 2019). For example, the opportunity to live on one’s traditional estate(s) (*country*) has been shown to provide significant health benefits (Burgess et al., 2009; Thompson et al., 2013) and reduced community conflict outcomes (Social Ventures Australia [SVA] 2016). For effective Indigenous policy initiatives, understanding linkages among various well-being sectors and *the country* is fundamental to develop an effective program for delivering required well-being outcomes.

We acknowledge that achieving good health, employment and income, or educational and learning opportunities are important to enhance peoples’ well-being, but these achievements should be in ways that people aspire to. Thus, the aim should be enabling people, building and utilizing their capabilities, and offering them the right opportunities, following *Sen’s Capability Approach* (1993 & 1999). Sen argues that peoples’ capabilities enable them to do things which make them feel proud and to lead lives the way people want. Offering opportunities to utilize peoples’ capabilities through appropriate policy settings can significantly advance peoples’ well-being, which is lacking in the current Australian Indigenous public policies (Bielefeld, 2014; Klein, 2015; Sangha, Russell-Smith, & Gerritsen, 2019).

The situation is markedly worse in Borroloola and Maningrida, as described in Table 2, compared to the national standards (details in Table 1), with <20% people completing Year 12 or equivalent, and <3% attending a tertiary or technical institution. The average median income is <\$320/week per person, and <\$1200/week per household, which may typically support 10 or more people. In contrast, median income for a non-Indigenous person is >\$900 and per household is >\$1700 per week. Despite >66% of the population aged 15 years and above, eligible as labour workforce, >60% of Indigenous peoples are either out of the labour force or unemployed in each community.

Peoples’ health status is poor in both communities with 28% suffering from diabetes in Borroloola and 12% in Maningrida, and ~5–7% from Chronic Heart Diseases and 3–6% kidney disease in each community (Table 2).

The current poor socio-economic and health situation in Borroloola and Maningrida is illustrative of many remote communities across northern Australia, suggesting a pressing need to find appropriate solutions to support remote communities.

4. Existing and future economic opportunities

We analyse a range of existing and future economic opportunities based on our on-going conversations with the Indigenous communities

Table 1

Comparison of the socio-economic conditions between Indigenous and non-Indigenous populations nationwide (ABS 2016).

ATTRIBUTES		Indigenous population	Non-indigenous population	
Employment and income	Percentage of employed people within the eligible workforce	42.0%	60.3%	
	Percentage of people either unemployed or not participating in the labour force (LF) within the eligible workforce	57.8%	39.2%	
	Percentage of people who earned a weekly household income of \$1000 or more	19.8%	41.0%	
	Weekly household income reported for over half of the population	Between \$150 - \$799	Between \$400 - \$1249	
Government payments and housing	Percentage of manager positions within employed people	6.9%	13.1%	
	Dependence on government payments (within 15 years old and more population)	52.0%	25.0%	
	Percentage of households who received help from at least one major housing assistance program	43%–46%	18.0%	
	House ownership	38.0%	66.3%	
	Percentage of people who experienced homelessness (>15 years old)	29.0%	13.0%	
	Percentage of persons who live in rural area	20.4%	9.7%	
	Percentage of persons who live in remote area	7.7%	1.7% in both remote and very remote areas	
	Percentage of persons who live in very remote area	14.0%		
	Education	Percentage of 20–24 years old people who finished year 12 or equivalent	46.9%	79.4%
		Health	Life expectancy	Female: 73.7; male: 69.1
All Government direct expenditure on provisioning services for supporting healthy living per person (2015–16) (source: Indigenous Expenditure Report 2017)	\$8462		\$4733	

across the north; outcomes from three workshops involving Indigenous participants (conducted in 2017–18) for a Payments for Ecosystem Services (PES) project funded by the Bushfire Natural Hazards Co-operative Research Centre (BNHCRC); and analyses of currently available data for both the communities. An integrated framework including two-way relationships between Indigenous peoples and their *country*, proposed by Sangha and Russell-Smith (2017), forms the basis for opportunities analysis as described below.

The presence of rich and diverse natural resources in the tropical parts of northern Australia, and a recent shift in global markets for trading nature’s services such as carbon sequestration, eco-tourism, etc. offer immense potential for the north to gain financial returns to support remote communities. Natural resource-based carbon and ecosystem services markets are contributing USD 36–42 billion p.a. globally (Salzman et al., 2018), and especially to the state economies of Costa Rica, Vietnam, Philippines, and Indonesia, amongst others (various case studies reported by The Economics of Ecosystems and Biodiversity [TEEB] 2019).

Table 2

Socio-economic and health attributes of Borroloola and Maningrida communities (Source: ABS 2016 and Department of Health, NT 2018).

ATTRIBUTES		Borroloola		Maningrida	
		Indigenous (number and percentage (%))	Non-Indigenous (number and percentage (%))	Indigenous (number and percentage (%))	Non-Indigenous (number and percentage (%))
Population	Total population	871		2612	
	Indigenous and non-Indigenous	669 (77%)	175 (20%)	2368 (91%)	171 (0.7%)
Education	Year 12 or equivalent (% within 15 years-old and over respective population)	48 (11%)	80 (46%)	317 (19%)	100 (58%)
	Did not go to school (% within total respective population)	18 (3%)	0	125 (5%)	0
	Attended an educational institution (% within respective population)	212 (32%)	26 (15%)	850 (36%)	32 (19%)
	Were in tertiary or technical institution (% within respective population)	7 (3%)	5 (3%)	13 (2%)	10 (6%)
Median total income	Median total average personal income (\$/weekly)	320	938	219	1506
	Median total household income (\$/weekly)	1162	1771	1076	2591
Labour and employment	Eligible workforce (more than 15 years old, % within respective total population)	440 (66%)	158 (90%)	1710 (72%)	140 (80%)
	Total labour force (% of Indigenous eligible workforce)	178 (41%)	125 (70%)	385 (23%)	135 (77%)
	Persons without job (i.e. number of persons not in labor force + number of unemployed persons) (% of the eligible workforce)	262 (60%)	36 (20%)	1204 (70%)	9 (5%)
	Number of persons aged >15 who are suffering from diabetes (% of population >15 years old)	123 (28%)	No Data	203 (12%)	No Data
Health	Number of persons aged >15 who are suffering from Chronic Heart Diseases (% of Indigenous population >15 years old)	30 (7%)	No Data	88 (5%)	No Data
	Number of tested people (>31 years old) having severe risk of kidney issue (% within the tested people of 31 years old and more)	18 (6%)	No Data	24 (3%)	No Data

In northern Australia, the carbon economy, limited to above 600 mm rainfall isohyet region, is delivering substantial economic, social and cultural benefits (Russell-Smith & Sangha, 2018). Under the Australian Government's Emissions Reduction Fund (ERF; Australian Government, 2020), since 2012 traditional prescribed burning is formally recognised as contributing to Australia's national greenhouse gas (GHG) emissions abatement accounts. For these projects, Indigenous knowledge of prescribed burning coupled with modern technology supports early dry season (EDS; March–July) prescribed fire management to reduce the extent of wildfires, and associated GHG emissions in the late dry season (LDS; August–November) (Russell-Smith et al., 2013). Such carbon abatement projects offer a substantial economic opportunity.

In Borroloola, Waanyi-Garawa rangers are at the early stage of developing and implementing a carbon project on the Waanyi-Garawa ALT of 11,000 km² area which could conservatively abate, on average, 10,000–20,000 tonnes of CO₂-e p.a. (depending on the baseline year) to deliver carbon benefits between \$100,000–\$200,000 p.a. (Fig. 2 and Table 3). Further, the introduction of an associated carbon sequestration methodology, possibly as early as 2022, for storing carbon in dead woody and living tree biomass, may deliver additional benefits between \$300,000–\$1,000,000 p.a. (Russell-Smith et al., 2015). If other ALTs (Garawa of ~5000 km² and Narwinbi ~1350 km² area) also undertake savanna burning projects, the region could feasibly deliver project incomes of between \$450,000–\$1.5million p.a. (Table 3 and Fig. 2).

In the Maningrida region, a pioneer savanna burning project has been operational since 2006 on an area of 28,000 km², delivering ~\$2.5million p.a. (Fig. 3). Since 2013, that project has expanded to include most of Arnhem Land under an Aboriginal-owned umbrella entity—ALFA Ltd. The entire project now, covering an area of 80,000 km², collectively affords a minimum turnover of ~\$10million p.a. (in 2016) (Cooke, 2019).

Carbon projects also generate culturally appropriate work opportunities. Currently, there are 10 Waanyi-Garawa rangers in Borroloola managing the Waanyi-Garawa ALT, and 30 Djelk rangers in Maningrida conducting prescribed burning and other land management activities, in

collaboration with Traditional Owners (Table 3). Additionally, 20 Lianhawirriyara rangers in Borroloola manage sea country and an extensive marine IPA, including the Sir Edward Pellew group of Islands—an internationally significant conservation area. Although the Commonwealth's WoC and IPA programs mainly support ranger programs (particularly in Borroloola), carbon projects can generate extra funds to stimulate and support other community-based enterprises including generating local Aboriginal peoples' cultural (e.g. schools, art centres) and enterprise aspirations (e.g. provision of maintenance services to outstations; infrastructure projects).

The local organisations, Mabunji Aboriginal Corporation (MAC) in Borroloola, and Bawinanga Aboriginal Corporation (BAC) in Maningrida (BAC 2018), employ ~100 and 200 people, respectively. Additionally, these organisations offer opportunities for CDP (Community Development Program) workers, offering employment to 300 persons in Borroloola and 600 in Maningrida (per. comm. with the CEO of MAC and the former Djelk Ranger Co-ordinator in Maningrida) (Table 3). There are few locally owned businesses in both communities – a local grocery store, a petrol station, and an art centre. Other opportunities such as crocodile farming and licences to fish or lease also exist in Maningrida (Table 3).

A large open-cut, zinc-lead, McArthur River Mine, operated by the Glencore mining company, exists (on private land) about 60 km from Borroloola. Although the mine claims to afford jobs for local people, which are typically a few less than five people at any one time (MRM Community Benefits Trust, 2010), apart from serious impacts on people's values and the river flows as discussed later.

Fishing and ecotourism opportunities are substantial in both towns (Table 3). The economic potential of the region's fishing industry is estimated at \$5.2 m/yr, using fish catch data from the NT Department of Primary Industries and the 2019 market fish price in Darwin. King Ash Bay fishing club near Borroloola is well-known fishing spot but it delivers private benefits to a few non-Indigenous people only who manage/own the club. Likewise, there are opportunities for leasing or entrepreneur fishing licenses in Maningrida. However, existing government arrangements restrict any such arrangements for Indigenous peoples due to a

Table 3
Existing and future economic opportunities in Borroloola and Maningrida.

OPPORTUNITIES	Borroloola	Maningrida
Existing economies and enterprises		
Carbon Economy	Waanyi-Garawa ALT is planning to register for a carbon abatement project under the ERF which can deliver \$100,000-\$200,000 per annum.	The Arnhem Land area generates about \$10million p.a. (Cooke, 2019)
Number of rangers (% of total employed persons)	10 Waanyi-Garawa (full-time and part-time rangers) and 20 Li-anthawirriyarr rangers (i.e. 11.15% of total employed persons in Borroloola)	30 Djelk (land and sea) Rangers (i.e. 7.89% of total employed persons in Maningrida)
Number of people employed by the local Aboriginal organisation	On average, MAC supports ~300 people on CDP and employs ~100 people per year.	BAC supports ~600 people on CDP, and employs ~200 people/yr on average.
Main businesses	Few local Indigenously owned businesses: a grocery store, a petrol station, an art centre, etc. Main businesses such as two motels, 2 petrol stations, mechanics, café, etc. are owned by the non-Indigenous people.	Some businesses e.g. grocery stores (Barlmark supermarket and Outdoor supply store), an art centre, museum, auto shop and a workshop are owned by the Indigenous people through BAC. The Djelk rangers also run a crocodile business which generates ~\$100,000 each year.
Potential future opportunities		
Carbon economy	An estimated benefit of between \$450,000-\$1.5million p. a. for carbon abatement and sequestration if all the local ALT area is registered for carbon projects.	Carbon abatement scheme already existing, but sequestration can further enhance the existing benefit by five folds.
Fisheries, Ecotourism, and National Park (NP)/ Conservation Reserve (CR) management-related opportunities	King Ash Bay, well known spot for recreational fishing in the region, offers credible economic opportunity for fisheries (estimated at \$5.2m p.a. using available fish stock data from the NT Primary Industries and the 2018 market price in Darwin). Pristine savanna landscape, proximity to the coast, remarkable landscape features such as China wall, McArthur River, and cultural sites offer unique opportunities to develop eco-tourism in the region. Locals can be trained and skilled to manage their neighbouring NP and CR such as Limmen NP, Caranbirini and Bullwaddy, which currently lack any Indigenous involvement. Under ALRA locals have exclusive right to the tidal zone adjacent to their ALTs which means that for non-Indigenous people to access and fish in the ocean next to the ALTs permits are necessary. Existing arrangements allowing them to access those areas are only valid until May 2019, pursuant to Section 5(8) of Aboriginal Land Act (NT).	The region is known for eco-tourism and supports local businesses such as Arnhem Land Eco-Cultural Tours, Maningrida Safaris, etc. that can be expanded. The locals own Aboriginal Coastal Licence (ACL) and BAC supports them for lending equipment, infrastructure, assets and resources. There are around 20 ACL holders and 7 mud crab license holders. Selling and leasing a mud crab license or ACL can afford between \$20,000 and \$30,000 p.a. to the license holder. However, such opportunities need to be promoted and supported for the benefit of the community.

Table 3 (continued)

OPPORTUNITIES	Borroloola	Maningrida
	Access permits for the local Aboriginal people will afford significant economic repayments in the form of developing own fishing business, leasing or selling the permits.	
Management of feral animals and weeds		Feral pigs, water buffaloes, donkeys, cattle and horses (Brumbies) are a serious problem in the region. Locals can be trained and employed to manage them.
Feral water buffaloes, pigs and horses are a major problem where locals can be trained and employed.	Currently, although buffaloes hold beef value to some extent and are processed at Livingstone Beef abattoir near Darwin for export and local sale, but the abattoir operations are suspended since September 2018. This will increase feral buffaloes, with increasing impact on the natural systems and cultural values of the Arnhem Land landscape.	
Delivery of Emergency Management and town services	Both Borroloola and Maningrida communities are frequently exposed to floods, cyclones and bushfires hence often require emergency services. Currently, there is little involvement of locals in Emergency Management and in day-to-day town management services. Occasionally, the CDP workers are supported by the council and MAC/BAC to work in the communities. Involving and up-skilling locals to manage their assets and deliver emergency, town, and weed/pest management services, and assist their own people offers feasible economic opportunities, some of which are currently being explored under a 'Building remote community resilience' project funded by the Bushfires Natural Hazards Cooperative Research Centre.	

moratorium until December 2020 (pursuant to Section 5(8) of Aboriginal Land Act (NT)). This is despite the High Court Blue Mud Bay landmark decision in 2008 that recognised Indigenous rights to the intertidal zones in the ALT area which comprise 80% of the NT coastline. That decision enables Indigenous landowners to establish their fishing businesses, or develop lease agreements with the commercial fishers who essentially are free-riders at present.

Management of neighbouring national parks and conservation reserves, including weeds and pests on crown lands, offers another opportunity. For example, Indigenous peoples can be trained and given the responsibility to manage the Limmen NP, Caranbirini and Bullwaddy reserves near Borroloola which are currently managed by the NT Government rangers (Table 3). Likewise, emergency management services, which are much needed in these towns due to their frequent exposure to cyclones and bushfires (Sangha, Edwards, & Russell-Smith, 2019), can be delivered by trained and skilled Indigenous emergency personnel. Town infrastructure maintenance services offer another avenue where typically Indigenous peoples are employed as CDP workers, not as employees.

Collectively, the above-mentioned enterprise opportunities would provide very significant local benefits, involving inter-generational exchange and application of culturally appropriate knowledges and skills that will enhance peoples' well-being and save public costs (e.g. health,

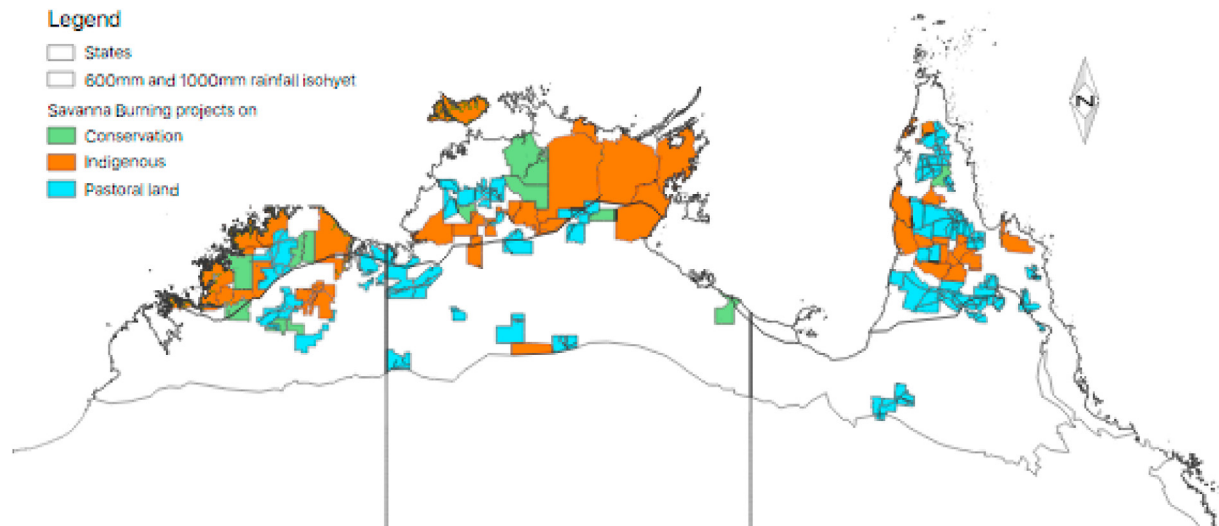


Fig. 3. Savanna Burning projects on Indigenous lands as on August 22, 2019.

domestic violence, youth incarceration, and management of natural resources over a long-term: Sangha et al. 2019 ab; Taylor & Stanley, 2005). In addition, local economic opportunities will deliver several non-market benefits for enhancing cultural practices and learning, supporting identity and cultural responsibilities, and for enabling people to lead their lives in their ways. Such local opportunities will help build resilience and sustainability of Indigenous communities which is much needed in the current situation of COVID-19 to make remote communities self-sufficient.

5. Discussion

Indigenous communities offer substantial, unique, and culturally appropriate opportunities for delivering sustainable socio-economic and environmental benefits for the wider public over the long-term. Existing key successful examples include savanna burning, eco-tourism and art centre related enterprises, particularly in Maningrida (Table 3). The carbon economy is already operating on >342,000 km² area across northern Australia (Fig. 3), with 13 projects on ALRA lands, 31 on Native Title land, and 46 under one or more Indigenous Land Use Agreements. These projects collectively cover ~180,000 km² and abate about 2.8million tonnes of GHG emissions annually (equating to \$40million/yr; using an average price of \$15.74/tonne of abatement as per Emissions Reduction Fund auctions in September 2020). The region also offers immense renewable (particularly solar, pumped hydro) energy potential that can fulfil national energy demand as well as generate substantial exports to the Asia-Pacific region (Chambers et al., 2018). There are significant long-term benefits for governments to invest in and contract Indigenous communities to manage their traditional homelands, towns, and neighbouring conservation lands. This paper highlights the feasible opportunities that can turn remote communities into fulcrums of new economies; informing state and federal government policies on developing the north.

Due to the slow uptake of innovative ideas to support remote Indigenous economies, there has been no or limited improvements in the socio-economic situation of remote communities over time. Earlier, Taylor and Stanley (2005) estimated the opportunity cost of engaging and enabling a remote community in the NT, Thamarrurr, at \$39.8million per year (equating to \$55.2million in 2019), suggesting enabling local people can deliver multiple benefits. We advance that idea using the current carbon economies as an exemplar which effectively started in Arnhem Land in 2006, demonstrating that innovative economies are achievable. The uptake and expansion of carbon economy to non-savanna vegetation (i.e. below 600 mm rainfall isohyet where

savannas burning methodology is not applicable) and to ecosystem services economies (i.e. biodiversity and water credits, etc.) have been slow largely due to policy impediments, as discussed below.

The key challenges to progress innovative economic opportunities include: applying non-conventional economic approaches to understand the value of Indigenous land management, in the interests of public (vs. private) benefits (Concu, 2011; Whitehead & Oliver, 2014); and developing right policy settings to advance innovative opportunities (Dale, 2019). Currently, except for GHG emissions abatement and eco-tourism, there is limited government support to establish emerging ecosystem services markets (i.e. biodiversity, water, etc.) and the related policy instruments (Russell-Smith, James, et al., 2019). Our two case studies epitomize the stark challenges that exist in many remote communities across northern Australia—despite Indigenous peoples having rights to ~2.2 m km² in the region.

Currently, there are five generic barriers at a community level: 1. lower levels of, and lack of culturally appropriate education in, remote communities (CoA, 2017, 2018 & 2020; ABS 2016) that limits people's ability to undertake development initiatives (James et al., 2019); 2. lack of culturally appropriate local governance structures that restrains people from participating in any government-led development related discussions (Dale, 2019); 3. lack of strong Indigenous leadership (Archer et al., 2019); 4. lack of genuine and active engagement of local people in government/private agency initiated community decision-making processes (James et al., 2019); and 5. restricted permission to use Aboriginal land for diversification purposes, e.g. eco-tourism, carbon or ecosystem services markets under current lease arrangements (Fuller et al., 2005; Winer et al., 2012). Establishing culturally appropriate processes and strategies through active consultation with communities by applying a bottom-up approach, will help achieve better outcomes both for local communities and investors over the long-term. Moreover, such an inclusive approach will reduce the risk and associated management costs for large investment projects (details in Morrison et al., 2019 and Russell-Smith, James, et al., 2019).

Indigenous land rights vary across three jurisdictions i.e. WA, Qld, NT which has obvious implications for consistency in northern development policy (Altman & Markham, 2014). For example, in WA, the Aboriginal Land Trust is a statutory body under the Aboriginal Affairs Planning Authority Act (1972), managing and holding 24 m ha of the Indigenous estate, which is required to be divested among the Indigenous owners (in other words, the Trust has yet to hand over 24 m ha of land to entitled Indigenous peoples). In the NT, the ALTs, covering 63.1 m ha of land, are either scheduled to, or have been handed back as inalienable freehold under ALRA (1976), regulated through the Northern and Central Land

Councils. The Native Title and ILUA entitlements are similar across jurisdictions, but lack appropriate recognition of Indigenous rights to co-benefit from commercial enterprise opportunities such as carbon projects on Native Title (inclusive) land (Altman & Markham, 2014; Dore, 2019). To support and maintain Indigenous peoples' relationships with land, the Indigenous land titles lack the quality of transferability and fungibility where properties are interchangeable or sold in the market (Australian Human Rights Commission, 2016). Thus, this makes a compelling case for developing on-site solutions to ensure equitable and sustainable development of remote communities.

Two unique advantages of northern Australia include distribution of people across the entire landscape, and perpetuity of Indigenous peoples' relationships with *country*. Managing the vast northern landscape delivers various non-conventional, economic opportunities (as shown from two case studies in Table 3), contrary to limited ideas provided in the current 'Developing the North' (CoA, 2015) agenda. Such approaches will save substantial government expenditure on Indigenous welfare.

The first key Indigenous advantage is the distribution of Indigenous peoples across the entire remote, vast, sparsely populated (1 person/1.33 km²) northern landscape (Fig. 1). Out of a total of 1200 Indigenous communities (of size 1–3500 people) across Australia, >70% are situated in the north (Altman, 2014). Concurrently, this landscape is highly prone to extensive and frequent bushfires (Russell-Smith et al. 2013, Russell-Smith, Edwards Sangha, Yates, Gardener, 2019; Russell-Smith & Whitehead, 2015), cyclones, storms and floods that currently cost an estimated \$11billion p.a. for the NT, Qld and WA (Australian Business Roundtable for Disaster Resilience and Safer Communities [ABR DRSC] 2017, p. 120). Much of these costs could be saved by engaging Indigenous people in land- and emergency management-services (Concu, 2011; Sangha et al. 2017, 2019b).

Another key advantage, often ignored in policy decision-making, is the perpetuity of living on, and connectedness to, *country* given peoples' enduring relationships and responsibilities are passed on from one generation to the next (James et al., 2019). Conversely, non-Indigenous people who move to remote locations for work typically stay there for short periods—for example, the high annual teacher turnover rates in several remote schools (Lock et al., 2012; Rice et al., 2017). Similarly, highly paid personnel, e.g. Chief Executive Officers of Aboriginal Corporations, who typically are non-Indigenous, are employed on short-term contracts (<5 years). In every remote community, most Indigenous peoples work at the entry level, few in middle management but seldom at the top level. At the time of this study, the CEOs of Aboriginal Corporations in Maningrida and Borrooloola, and their predecessors, are non-Indigenous. Inequitable distribution of monies among employed Indigenous vs. non-Indigenous people is another issue impacting on sustainable regional development.

Moreover, Indigenous peoples managing their land derive direct benefits for improved health, employment, education, and reduced domestic violence and incarceration outcomes—saving government welfare costs (Taylor & Stanley, 2005; Gilligan, 2006; Burgess et al., 2009; Sangha, Brocque, et al., 2015,b, 2017, 2019a; Hamburger et al., 2016; SVA 2016). We estimated these cost savings for case study communities (Table 4) assuming that developing on-*country* job opportunities will benefit currently unemployed ~1400 people (following Sangha et al., 2017 and 2019a; SVA 2016). We accounted for half of the Indigenous welfare expenditure on four welfare sectors i.e. safe and supportive environment, economic participation, health, and early childhood education (using the NT specific data from the Indigenous Expenditure Report [IER] by the SCRGSP [2017]). The estimated cost-savings were ~\$49million per year. In other words, offering opportunities to 262 people in Borrooloola saves about \$8.8million, and to 1204 people in Maningrida saves \$40.4million per annum (Table 4). Since domestic violence and incarceration rates are of particular concern in the NT and working on *country* helps in reducing both (SVA 2016; Hamburger et al., 2016), we also accounted for 50% of cost-savings that were estimated at \$3.6million for Borrooloola and \$16.8million for Maningrida (Table 4,

Table 4

Estimated cost-savings for engaging jobless people in Borrooloola and Maningrida in suitable land-based economic opportunities (using NT-specific IER (2017) data).

COST-SAVINGS	Borrooloola	Maningrida
Persons without job (i.e. number of persons not in the Labour force + number of unemployed persons)	262	1204
Welfare savings^a:		
– safe and supportive environment ^b	1,966,179	9,035,418
– economic participation ^b	1,163,411	5,346,362
– health ^b	740,674	3,403,708
– early childhood education ^b	1,258,517	5,783,414
Saved cost from domestic violence^c	2,577,818	11,846,156
Saved incarceration costs^d	1,104,723	5,076,666
Total	8,811,322	40,491,724
Welfare sector		\$/head/ yr
1. Developing safe and supportive communities		15,009
2. Enhancing economic participation		8881
3. Healthy lives: subsector – public and community health & support		5654
4. Early childhood development, education and training		9607

^a Welfare expenditure per head of Indigenous population in the NT is \$68,186/year (IER data for 2015-16 by the SCRGSP 2017).

^b Accounting ½ of the costs per head (\$/yr) for each sector using NT specific data for jobless Indigenous people in the selected two communities, as below.

^c Cost of domestic violence attributable to community including health, production- and consumption-related costs, and others (\$19,678/head/yr; SVA 2016).

^d Cost of public order and safety per head using IER (\$8433/head/yr; SCRGSP 2017).

methodology details in footnotes). These estimates are in line with the opportunity costs assessed by Taylor and Stanley (2005) at \$39.8 million per year for the Thamarurr community in the Top End. At the NT scale, the welfare-related cost savings range between \$128-\$471 million p.a. as outlined in scenario analysis of government welfare expenditure (Sangha, Russell-Smith, & Gerritsen, 2019) following an integrated framework linking Indigenous peoples' well-being with connections to *country* (Sangha & Russell-Smith, 2017). These estimates are supported by SVA (2016) suggesting a three-fold social return on investments in Indigenous Protected Areas for the Australian Government.

To 'Develop the North', building capabilities of people who permanently live in remote places is a rational economic approach. A similar approach has earlier been proposed by Taylor and Stanley (2005), but we extend it further by providing a detailed description of various opportunities that are culturally appropriate and feasible in remote communities. The proposed approach will ensure stable long-term returns and will save on-going government expenditures—invoking Sen's Capability Approach (1993 & 1999) that emphasises building peoples' capabilities at the forefront of development. Such an approach will ensure inclusive development of the north (Morrison et al., 2019) and will deliver many environmental benefits as mentioned by Concu (2011); Whitehead and Oliver (2014), and Russell-Smith, James, et al. (2019). The variety and magnitude of opportunities in both the selected communities are huge as outlined in Table 3—with existing and budding carbon economies and potential fisheries, ecotourism, conservation and fee-for-service sector economies. To date, the Australian Government policies have rarely considered Indigenous capabilities and advantages (Klein, 2015; Sangha, Russell-Smith, & Gerritsen, 2019), let alone their consideration in developing appropriate opportunities (except for programs such as WoC/IPA).

The McArthur River Mine near Borrooloola is a perfect example demonstrating the kind of economies the Australia Government is interested in creating for the north. This mine has been established in the 1990s, as an open-cut, with expansions granted in 2009, and 2013 despite its devastating, long-term serious impacts on local culture, songlines, environment, and on the McArthur river (Zaar, 2009; Vanovac

and Breen 2017). With approval from the Federal Government in 2009, the river was diverted for 5.5 km for expanding open-cut mining operations, further increasing the risk of zinc-lead flows into the river during cyclones, floods and storm events that are frequent in the region. This study is timely for informing the government's development agenda about the alternatives that Indigenous peoples and landscapes offer to foster sustainable economies across the remote, vast savannas that will also benefit the wider Australian and global public.

Our analyses offer an economic rationale and demonstrate that innovative economies can generate >\$10million p.a. in each selected community, in addition to local jobs, culturally appropriate opportunities, and better management of the local environment (Table 3). In contrast, the Australian Government's approach to primarily continue with resource extractive economies such as mining, pose serious concerns for on-going environmental effects (involving substantial social costs), perpetuating poor socio-economic outcomes in remote communities, and dispossession of Indigenous peoples (Gerritsen et al., 2019; Sangha, Russell-Smith, & Gerritsen, 2019). In the past, different state and federal policies have attempted to relocate people from various outstations and small community towns to urban centres, labelled as 'Growth Hubs' (NT intervention policy under the NT Emergency Response Act 2007 (NT TheNorthern Territory Government, 2007), Kagi (2014) - the ABC news, Wahlquist (2016) - The Guardian news). Such a restrictive government approach completely overlooked the extent of benefits that Indigenous peoples derive, and provide, from living and working in remote areas. To date, the state/territory and federal Australian Governments have considered largely the resource extractive economies in the north (CoA, 2015), but omitted the long-term and multiple benefits that innovative land sector-based opportunities can generate in the north.

A transformation in the current government approach to development and the related policies is essential. A broader, long-term, inclusive development, as advocated by Russell-Smith et al. (2019), is important not just for the Indigenous peoples but also for the wider public to continue obtaining benefits from well-managed natural resources in the north. The success of the Australian Government's WoC program and carbon economy for delivering multiple benefits for remote communities is a testimony to our proposed approach in here. Focusing on key Indigenous advantages—living in remote locations in perpetuity, knowledge and skills to manage the vast northern landscape, cultural norms to share with others, exclusive rights to Aboriginal lands and coastal areas—acknowledges that investment in inclusive development strategies is a rational approach to develop the north while delivering benefits to the wider Australian and global public.

6. Conclusions

This study presents a detailed account of diversity and magnitude of economic opportunities that exist for remote Indigenous communities across northern Australia, using Borroloola and Maningrida in the NT as case studies. The innovative ecosystem services-based opportunities are real and feasible under the current global scenario (given their demand and magnitude of USD 36–42 billion per year; Salzman et al., 2018)—affording culturally appropriate opportunities for remote communities. However, its implementation requires transformational changes for policy planning and related programs to initiate sustainable, holistic, and culturally appropriate development of Indigenous peoples across remote northern Australia.

Author contributions

Dr Kamaljit K. Sangha: is an ecological economist at the Darwin Centre for Bushfire Research, Charles Darwin University. She planned this research, analysed data and wrote the original draft of this article with inputs from co-authors. Adele Duvert: visited the Darwin Centre for Bushfire Research, Charles Darwin University under her overseas

educational experience program. She collected and analysed the Data. Ricky Archer: is the CEO of North Australia Land and Sea Management Ltd. He has previously worked as a Ranger Co-ordinator at Maningrida, NT. He has provided insights for for this research. Prof Jeremy Russell-Smith: is Professor of Fire Ecology at the Darwin Centre for Bushfire Research, Charles Darwin University. He edited and contributed ideas to the earlier draft drafts of this manuscript.

Declaration of competing interest

We state that there is no actual or potential conflict of interest including any financial, personal or other relationships with other people or organisations.

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