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SOCIAL ANTHROPOLOGY | RESEARCH ARTICLE

Indigenous environmental values as human values

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Abstract: The claim that in natural resource management (NRM) a change from anthropocentric values and ethics to eco-centric ones is necessary to achieve sustainability leads to the search for eco-centric models of relationship with the environment. Indigenous cultures can provide such models; hence, there is the need for multicultural societies to further include their values in NRM. In this article, we investigate the environmental values placed on a freshwater environment of the Wet Tropics by a community of indigenous Australians. We discuss their environmental values as human values, and so as beliefs that guide communities' understanding of how the natural world should be viewed and treated by humans. This perspective represents a step forward in our understanding of indigenous environmental values, and a way to overcome the paradigm of indigenous values as valued biophysical attributes of the environment or processes happening in landscapes. Our results show that the participant community holds biospheric values. Restoring these values in the NRM of the Wet Tropics could contribute to sustainability and environmental justice in the area.

1. Introduction

The way we see the world shapes the way we treat it. If a mountain is a deity, not a pile of ore; if a river is one of the veins of the land, not potential irrigation water; if a forest is a

ABOUT THE AUTHOR

Monica Gratani's research interest and expertise is in community development, in particular involving indigenous communities. Her most recent work focused on how to integrate indigenous knowledge in environmental management, and was based on a case study conducted in collaboration with a community of indigenous Australians of the Wet Tropics. She and her co-authors are part of a multi-disciplinary team which addresses development issues from the perspectives of environmental and medical anthropology, indigenous ecological knowledge, political ecology, social-ecological systems approaches, coastal fishery management and biodiversity conservation. The group works in a wide variety of socio-economic settings.

PUBLIC INTEREST STATEMENT

The research reported in this paper focused on understanding how a community of indigenous Australians value the environment and wish it to be managed. Indigenous people all over the world are often marginalised from decision-making around matters of natural resources and the environment. In Australia, indigenous people are particularly disempowered and have little control on their own traditional estates. We conducted this project to understand the perspective of the participant community as first step towards achieving environmental management more respectful of the local Traditional Owners' perspective.

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sacred grove, not timber; if other species are biological kin, not resources; or if the planet is our mother, not an opportunity––then we will treat each other with greater respect. Thus is the challenge, to look at the world from a different perspective. (David Suzuki)

The way societies approach natural resource management (NRM) is a reflection of their values, ethics and how they define and measure quality of life. Historically, "western" societies have been associated with egoistic values, anthropocentric ethics and understanding of quality of life based on materialism. Such perspectives have allowed for natural resources to be irresponsibly exploited, provided the right technology was available and cost-effective (Merchant, 1992). A materialistic approach to NRM is increasingly recognised as unsustainable and a change in values and ethics towards more sustainable ones is advocated (CBD; van Egmond & de Vries, 2011). On the other hand, universalist/biospheric values are being increasingly correlated with pro-environmental behaviours (Axsen & Kurani, 2013; Clark, Kotchen, & Moore, 2003; Gärling, Fujii, Gärling, & Jakobsson, 2003; Schultz & Zelezny, 1998; Stern & Dietz, 1994; Teel, Manfredo, & Stinchfield, 2007).

Indigenous cultures may represent sources of such environmental values alternative to dominant materialistic ones. A number of authors have argued that historically indigenous cultures were underpinned by eco-centric values and holistic, non-materialistic worldviews (Banerjee, 2002; Hawke, 2012; Mercer, Christesen, & Buxton, 2005). Recent research indicates that many indigenous societies worldwide still hold such values and worldviews, despite globalisation and the consequent erosion of their traditions (Hawke, 2012; Kelbessa, 2005; Michell, 2005; Royal, 2012; Snodgrass et al., 2007; Voeller, 2011; White, 2010); hence, one could argue that by developing a set of values to inform NRM that reflects indigenous worldviews, a more sustainable approach to NRM can be promoted. NRM that is inclusive of indigenous environmental values can also enable environmental justice and the survivorship of cultural minorities, which are at risk of cultural assimilation by mainstream capitalistic societies (Razak, 2003).

In Australia, the contribution indigenous environmental values can make to sustainability thinking is under-researched and hindered by the current approach to environmental values and NRM research. Mostly, environmental values are conceptualised as biophysical attributes of the environment, such as landscape features and formations, and sites, processes and properties such as endangered species and biodiversity; this conceptualisation permeates much of the literature on modern NRM and conservation (Bentrupperbäumer, Day, & Reser, 2006). Within environmental values, the connection that indigenous Australians have with water has mostly been framed within a material cultural heritage paradigm which results in attempts to protect aboriginal heritage through the identification of cultural sites of importance that need management according to archaeological techniques (Jackson, 2006). This paradigm does not serve indigenous Australians well as it is not adequate to convey understanding of how they see the environment and would like it managed.

Another problem with the way indigenous environmental values are defined in Australia is their labelling as "cultural". The expectation that indigenous values for the environment are cultural is reflected in official planning documents and processes (Jackson, 2006). For example, the Australian and New Zealand Environment and Conservation Council (ANZECC) water quality guidelines, which underpins much of water management planning in Australia, categorise the water values as aquatic ecosystem, human consumption, recreation, spiritual and cultural values, industrial use, aquaculture, irrigation, stock watering, farm use and drinking water, and expectations may be raised that the category "cultural and spiritual values" suffices to represent indigenous values for water (ANZECC, 2000). The main consequence of looking at indigenous water values as only cultural is that water resource managers tend to look into heritage management practices to manage matters that are considered "cultural and spiritual", and tend to search for water places to protect, in order to support indigenous water values: this approach may result in overlooking indigenous people's interests in other aspects of water management like economic values for water (Jackson, 2006; Jackson, Finn, & Featherston, 2012; RAPA, 2011). Such an approach is detrimental to the holistic indigenous

worldviews (Jackson, 2006; Jackson, Storrs, & Morrison, 2005; Langton, 2011; Maclean & Bana Yaralji Bubu, 2011; Ross, 1996; Toussaint, Sullivan, & Yu, 2005; Trigger & Mulcock, 2005).

To overcome the conceptualisation of environmental values as biophysical attributes of the environment, it has been proposed that environmental values should be considered as human values, and therefore as "individual and shared community or societal beliefs about the significance, importance and wellbeing of the natural environment, and how the natural world should be viewed and treated by humans" (Bentrupperbäumer et al., 2006; Jackson, 2006; Jackson et al., 2005; Reser & Bentrupperbäumer, 2005, p. 141). As such, environmental values are ethical principles that guide individual and societal decisions about the environment (Bentrupperbäumer et al., 2006; Reser & Bentrupperbäumer, 2005). To date, however, none of the available studies on indigenous environmental values, in the Australian context, has discussed them from this perspective (see e.g. Barber & Jackson, 2011; Goode, Irvine, & Iguana, 2003; Grice, Cassady, & Nicholas, 2012; Larrakia, 2008; Maclean & Bana Yaralji Bubu, 2011; Venn & Quiggin, 2006).

In this perspective, this papers aims at understanding the environmental values of a community of traditional owners of the Wet Tropics of Queensland places on the environment, and at discussing them as human values. The paper also highlights what contribution this shift in perspective can make to discourses of environmental sustainability and justice.

We initially define the terms of values and its relationship with environmentalism, before moving to the usual methodology, results and discussion and concluding sections of the paper.

2. Defining environmental values: insights from philosophy, psychology and social sciences

Values are related to the concept of beliefs. Beliefs are understandings about the state of the world that are typically considered *facts* to those who hold them since individuals are usually unaware their understanding of the world is socially and culturally constructed (Olsen, Lodwick, & Dunlap, 1992). Values are a special set of beliefs about what is good and evil, right and wrong, beautiful and harmonious or not (Vidal, 2008).

In 1987, Schwartz and Bilsky proposed a definition of values which encompasses much of the work preceding them (Dietz, Fitzgerald, & Shwom, 2005): values are beliefs about desirable end states or behaviours that transcend specific situations and guide selection or evaluation of behaviours and events. Hence, values are guiding principles which provide individuals with motivation to identify goals and criteria to guide actions and achieve them (Schwartz, 1994). This definition resonates with the work of Reser and Bentrupperbäumer, who argue environmental values are beliefs held by individuals and societies about the significance, importance and well-being of the natural environment that inform how humans should treat the natural world (Reser & Bentrupperbäumer, 2005).

In his theory of universal human values, Schwartz (1994) argues there are 56 universal values that can be found consistently across cultures (Table 1). These values guide individuals' actions to satisfy biological needs as well as the requirements for smooth social interactions and group survival (Schwartz, 1994). Based on similarities of the goal they support, these 56 values can be grouped into 10 value types (Table 2) conceptualised by Schwartz: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity and security. These 10 value types form a continuum, in a circular structure, since each value type shares emphases with adjacent ones. Hence, values that express opposing motivations are on opposite sides of the circle. This allows the orientation of value types along four axes which Schwartz names self-enhancement, conservation, self-transcendence and openness to change. The four axes are therefore "value orientations". Later, Schwartz and his commentators redefined the self-enhancement, conservation and self-transcendence value orientations as egoistic, traditional and biospheric value orientations, respectively,

Table 1. Human universal values, as conceptualised by Schwartz	
Schwartz's human values	
1. Equality (equal opportunity for all)	29. A world of beauty (beauty of nature and the arts)
2. Inner harmony (at peace with myself)	30. Social justice (correcting injustice, care for the weak)
3. Social power (control over others, dominance)	31. Independent (self-reliant, self-sufficient)
4. Pleasure (gratification of desires)	32. Moderate (avoiding extremes of feeling and action)
5. Freedom (freedom of action and thought)	33. Loyal (faithful to my friends, group)
6. A spiritual life (emphasis on spiritual not material matters)	34. Ambitious (hard-working, aspiring)
7. Sense of belonging (feeling that others care about me)	35. Broadminded (tolerant of different ideas and beliefs)
8. Social order (stability of society)	36. Humble (modest, self-effacing)
9. An exciting life (stimulating experiences)	37. Daring (seeking adventure, risk)
10. Meaning in life (a purpose in life)	38. Protecting the environment (preserving nature)
11. Politeness (courtesy, good manners)	39. Influential (having an impact on people and events)
12. Wealth (material possessions, money)	40. Honouring of parents and elders (showing respect)
13. National security (protection of my nation from enemies)	41. Choosing own goals (selecting own purposes)
14. Self-respect (belief in one's own worth)	42. Healthy (not being sick physically or mentally)
15. Reciprocation of favours (avoidance of indebtedness)	43. Capable (competent, effective, efficient)
16. Creativity (uniqueness, imagination)	44. Accepting my portion in life (submitting to life's circumstances)
17. A world at peace (free of war and conflict)	45. Honest (genuine, sincere)
18. Respect for tradition (preservation of time-honoured customs)	46. Preserving my public image (protecting my "face")
19. Mature love (deep emotional and spiritual intimacy)	47. Obedient (dutiful, meeting obligations)
20. Self-discipline (self-restraint, resistance to temptation)	48. Intelligent (logical, thinking)
21. Detachment (from worldly concerns)	49. Helpful (working for the welfare of others)
22. Family security (safety for loved ones)	50. Enjoying life (enjoying food, sex, leisure, etc.)
23. Social recognition (respect, approval by others)	51. Devout (holding to religious faith and belief)
24. Unity with nature (fitting into nature)	52. Responsible (dependable, reliable)
25. A varied life (filled with challenge, novelty and change)	53. Curious (interested in everything, exploring)
26. Wisdom (a mature understanding of life)	54. Forgiving (willing to pardon others)
27. Authority (the right to lead or command)	55. Successful (achieving goals)
28. True friendship (close, supportive friends)	56. Clean (neat, tidy)

Source: Struch and Schwartz (2002).

to avoid confusion with similar terms used in different NRM contexts (Dietz et al., 2005; Schwartz, 1994; Stern & Dietz, 1994).

Values are linked to environmentalism. The values-beliefs-norms theory of environmental concern and behaviour suggests that values "influence our worldview about the environment (general beliefs), which in turn influences our beliefs about the consequences of environmental change on things we value, which in turn influence our perceptions of our ability to reduce threats to things we value. This is turn influences our norms about taking action" (Dietz et al., 2005). Egoistic, altruistic and biospheric values are the most fundamental determinants of environmental concern since they change little during our lifetime, and strongly influence the rest of our worldview (Stern, Dietz, Abel, Guagnano, & Kalof, 1999). Since values have a role in decision-making, especially when we reflect on

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Table 2. Value types as defined by Schwartz (1994)		
Definition of value type		**Exemplary values**
Power	Social status and prestige, control or dominance over people and resources	Social power, authority, wealth
Achievement	Personal success through demonstrating competence according to social standards	Successful, capable, ambitious
Hedonism	Pleasure and sensuous gratification for oneself	Pleasure, Enjoying life
Stimulation	Excitement, novelty and challenge in life	Daring, varied life, exciting life
Self-direction	Independent thought and action-choosing, creating, exploring	Creativity, curious, freedom
Universalism	Understanding, appreciation, tolerance and protection for the welfare of *all* people and for nature	Broad-minded, social justice, equality, protecting the environment
Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact	Helpful, honest, forgiving
Tradition	Respect, commitment and acceptance of the customs and ideas that traditional culture or religion provide	Humble, devout, accepting my portion in life
Conformity	Restraint of actions, inclinations and impulses likely to upset or harm others and violate social expectations or norms	Politeness, obedient, honouring parents and Elders
Security	Safety, harmony and stability of society, of relationships and of self	National security, Social order, clean

difficult choices and we need to make a trade-off between our preference (Dietz & Stern, 1995), they follow that pro-environmental behaviours such as activism and public and private sphere behaviours will be more likely to be undertaken by individuals if they hold values that support them. To date, evidence that biospheric values support environmentalism has been produced by environmental psychology research, while the question if egoistic or traditional values support environmentalism is still under-researched (Dietz et al., 2005).

It should be noted that while values underpin actions, values alone cannot mandate pro-environment and sustainable behaviours since behaviours are ultimately constrained by individuals' needs and capabilities, which also depend on social, cultural and economic external factors along with personal beliefs (Dietz et al., 2005; van Egmond & de Vries, 2011; Schwartz, 1994; Stern, 2000; Sutton & Tobin, 2011).

Schwartz' is a well-established theory that has been validated in over 80 countries, in different cultures and that is increasingly informing research in environmental psychology; hence, we adopted Schwartz' definitions of values, value types and value orientations to discuss the findings of our case study. In doing so, we aim at promoting an understanding of indigenous environmental values as human values and at overcoming the cultural heritage paradigm.

Indigenous traditions worldwide have been discussed as holding biospheric values and holistic worldviews (Hawke, 2012; Kelbessa, 2005; Michell, 2005; Royal, 2012; Snodgrass et al., 2007; Voeller, 2011; White, 2010), and a higher representation of such perspective has been advocated as a means to achieve sustainability (van Egmond & de Vries, 2011).

3. Methods

3.1. Choice of participants and interviewing process

The Malanbarra and Dulabed Yidinji community resides in territory that extends from the Atherton Tableland to the west, to Innisfail to the south, Cairns to the north and Gordonvale to the east. The community can be defined as a Native Title community, a community brought together by Native Title interests (Davies, 2003), and includes numerous individuals with different histories of connection to Country, and more or less prolonged periods of relocation away from it. By virtue of its diversity, the community may be seen as fairly representative of the indigenous population of the Wet Tropics, and this may entitle me to a certain degree of generalisation of our conclusion. Nevertheless, participants to project accrue to 0.1% of the overall indigenous population of the Wet Tropics.

The project we hereby report was initiated by the Malanbarra and Dulabed Yidinji, who wanted to conduct a culturally sensitive assessment of the condition of their traditional estate in post-colonial era, so as to become better managers of it. The non-indigenous researchers involved in this project felt that the first step to design a culturally sensitive monitoring tool for the traditional estate was to understand how the community values the environment and feels about it, so as to design and conduct an assessment of the estate that was respectful of this perspective. We hereby refer this background work on the environmental values the community holds, while we discuss the environmental monitoring tool elsewhere.

Following community engagement and the signing of a research agreement, the community's Prescribed Body Corporate (PBC) directors for the Malanbarra and Dulabed Yidinji provided a list of members who were interested in taking part in the project. Twenty community members were interviewed. Overall, 25% of the PBC adult-registered members took part in the project, each a member of the community interested and active in the management of their Native Title area. In recruiting participants, we aimed for a gender- and age-balanced sample, so as to capture diverse perspectives existing in the community.

To understand the values, we conducted in-depth, semi-structured interviews and participant observations, a methodology recommended for values research, particularly in ethnographic contexts (Dietz et al., 2005). Interviews took the form of relaxed, amicable conversations with indigenous project participants held at a location chosen by them. Often, interviews were conducted on while spending time on Country, and this allowed the non-indigenous researchers to better relate to what was discussed about the local environment, and also the conduction of participant observations to substantiate interviews' findings. We used a pre-set list of questions to prompt interviewees when necessary (Table 3); however, we referred to it only loosely and encouraged project participants to talk freely about their connection with the environment, what they considered important in it, the reasons why and the nature of activities they conduct in the environment. Conversations usually had a focus on the river and surrounding rainforests, the main features of the community's estate. As is the nature of semi-structured interviewing, the depth and scope of discussions varied depending on the degree of connection between participants and the study area, as well as their expertise and interests. Most of the interviews lasted 1–1.5 h.

3.2. Data analysis

We transcribed interviews and coded transcripts inductively for theme analysis. During inductive coding, in the first phase––the open coding process––themes were allowed to emerge spontaneously from the words of participants (inductive coding). In a second phase––the theoretical coding–– we collapsed the open codes into overarching categories, which we named after Schwartz' values, so as to promote their understanding as human values. We then used the human values identified as main points for discussion.

The results of our research were presented to community leaders, who endorsed our understanding of their environmental values.

Table 3. Pre-set list of questions used to guide semi-structured interviews
How long have you been living in this area?
Can you tell me if your family has a specific area of responsibility?
What does it mean/used to mean for the management of Country?
Did you use to spend lot of time along the river as a kid?
Do you spend time on Country now?
What did you use to do while being there/what do you do while on Country?
Do you take children when you go to the river and what activities do you do with them?
During your lifetime how has Country changed? Did these changes affect your lifestyle?
Is there anything you are prevented from doing on Country?
Are ceremonies still conducted on Country?
Is the language still practiced in the community?
Are language names still given to children?
Do you still use traditional food from the river and the forest?
Does the community have a totem?
Can you list some of the reasons why the river is important to you?
Can you think of any place along the river that is particularly important for you?
What is the reason for that?

We use extracts from interviews to illustrate the point we discuss in our results and discussion section. Interviewees who authored the quotes are hereby identified only with two letters (TO), followed by a progressive number, to ensure personal anonymity.

4. Results and discussion

4.1. Indigenous values for the environment as human values

4.1.1. Protecting the environment for its connection with the people
A central theme that emerged from the interviews was participants' concern for the need to "protect the environment":

> Bana is life to us, we cannot do without! It means everything to us! In Bana there is food, there is healing, we cannot live without water. And that's why we need to fix it all up, we need to fix our river up because it's all gone to ruin. (TO23)

Many interviewees also pointed out at the difficulties in protecting the environment within current environmental management contexts:

> We want to protect the land and the environment, but now they don't listen to us. They split us and chased us away, and now they don't want Murri to go back to Country anymore. (TO15)

The importance to protect water came from the recognition of water as a life-giving force: some interviewees portrayed the river system, especially the river, its central feature, as a living being and referred to it as "him" rather than *it*, similar to observations in previous analogous research (Jackson et al., 2005; Maclean & Bana Yaralji Bubu, 2011). Interviewees pointed out that the river system has its own rights, and all human beings and especially traditional owners owe him respect. The river gives life to the people, plants and animals living beside it, a concept also observed in studies by Grice et al. (2012), Maclean and Bana Yaralji Bubu (2011) and Toussaint et al. (2005). Participants described the river system and Country in general as almost a super organism, to which plants,

animals and the human communities who dwell on him belong, and pointed out that excessive extraction of water from the river will impact the creatures that depend on it:

> Once you start taking water, which is the life giving, it affects everything in this Country, your trees, your grass, your animals, they need that water just like we do, so if you start taking that thing away you are going to start to see that these things deteriorate, your trees and your grass and all those things they start to die back, and the River starts to wither and they'll start to fall away too, you know. I have seen that happening before, and it's not good. (TO7)

In the holistic vision of participants, all components of the system are interconnected and can be mutually affected by changes, even those which occur farther away. One participant referred to the existence of karma for the river and Country in general, in addition to karma existing for people, implying Country, the river and the people are interconnected and rules of reciprocity apply:

> There is a karma for people and for Country, if you do bad you will pay back in your life. (TO14)

The river and his physical attributes were also described as an integral part of the same circle of life of animal, plants and people. For example, participants referred to the fact they were animals, rocks or water in "the dreaming", and from there, they "became" human beings (see also Toussaint et al., 2005).

Most participants suggested if the river is left untouched or used with respect, he has the ability to support the current plant, animal and human populations that depend on him. However, participants complained this ability has been impinged by post-colonial misuses and over-uses of the river, also recently highlighted in research on the general health of streams of the Wet Tropics (Tsatsaros, Brodie, Bohnet, & Valentine, 2013). Hence, now the river needs to be "left alone" so that he can heal himself. Participants often referred to the increasing need of a growing population, which demands water for "wrong uses", as a reason of great fear for the pressure it puts on the capacity of the river to support the system thriving around him:

> The river is us! We protect it more and want to protect it more, and we want to make sure that whoever uses this river uses it properly, we want to take few plants and put them back there, come down and stop the damaging of places, because we have sites on the river, we have burials, men's and women's places, it's the connection to us I think. (TO7)

There exists a fear that water may be used unsustainably, a concern recorded in similar case studies, such as the Daly River (Jackson et al., 2005). The core value of preserving the life-giving force of the river informed and still informs traditional practices used for the management of Country, which aim to "not take too much" and "preserve for future generation":

> We can still come here and that is the main thing, we can go back and do what our ancestors used to do, follow the footpath of our ancestors, not taking too much from the river, not cutting too much vegetation, that is the main thing. Murries want to maintain a traditional lifestyle if they can. (TO24)

The persistence of traditional rules for sustainable use and sharing of aquatic resources have been also recorded in indigenous water values-related research by Jackson et al. (2005, 2012), Maclean and Bana Yaralji Bubu (2011) and Toussaint et al. (2005), but this aspect of the Wet Tropics aboriginal culture is likely to become eroded if the local traditional ecological knowledge is not recorded and applied (Gratani, Bohensky, Butler, Sutton, & Foale, 2014; Gratani et al., 2011).

4.1.2. Unity and self-identification with nature

When talking about the river system, participants often described their intimate feeling of unity with nature and need for nurturing, celebrating and communicating their identity which ultimately they saw as grounded in their relationship with the environment:

> [The river] is like the blood in my veins! That's my food, everything comes from there, my life … that water, it's me! When you start messing things around you then start messing with us! And we start feeling sick and one wonder 'What's going on?', and this is where [it] all starts, but you know … that is like the blood in my veins! It's very, very important to me and my people. (TO7)

Many interviewees mentioned they have a language name that connects them to the river as well as to other features of the landscape. Many of the language names used in the community were intimately related with water, water cycle, species living in or around the river and activities within the river. For example, one language name is *Jullud*, referring to the stick used to pull eels out of the water, while another is *Burrun*, meaning the green frog that "passes out when the rain is coming". Language names were traditionally given to children by some of the elders, who observed the children's nature and temper and choose a name for them. A participant also added that before giving the language name, elders would wait for a vision that would "send the story", describing how that specific person came to be human and hence what her language name should be. Some participants further elaborated their identity comes from the river because they once were *in* the river and that "all incidents" that brought them to be born as humans happened in the river:

> You got all the stories from the river, and actually all the incidents happened in the river, so we are all connected to the river. We then became another thing, but we were in the river before. (TO9)

Moreover, often a personal totem is associated with the language name and the totem promotes a specific connection of the individual with a place, a feature or the landscape or a species inhabiting it. Community members have special caring responsibility for their totems, as observed in similar research with different communities (Jackson et al., 2005; Maclean & Bana Yaralji Bubu, 2011; Toussaint et al., 2005).

The sense of identity which stems from the river is also developed through the association of the entire cycle of life of individuals with specific cultural and special places on Country. Participants spoke of historical birth places under trees or in the water, especially in rapids, even if nowadays these birth places are not used by the local community:

> [Children] were born in the river, in the rapids, there are some birthing places along the river, sacred to women, there were several along the river, depending on where they were camping in different phases of the year. (TO13)

Instead, after the birth of a baby, they can still choose to bury the placenta on Country, so as to seal the association of one person to her own land. Also, language names can associate individuals with specific places. For example, *Bundil* and *Budil* are the two tips of a local mountain that serve as a clan boundary and they are also the language names of two young individuals in the community. Other special places are those where historical community events took place, such as corroborees or massacre places, and places that function as clan boundaries and as such regulate groups' relationships and resource access in the community. In some places, stories are believed to be "guarded" by the spirits of ancestors. Burial sites are kept in great regard, visited regularly and often used to reconnect with ancestors and seek their advice on special matters. Moreover, burial along the river is still practiced by the community, even if sporadically, and one participant reflected that she was happy to have the option of being buried on Country. Finally, "sacred places" are places where harvest and access to outsiders should be forbidden; these places are considered by participants as very beautiful and pristine but currently threatened by unregulated tourism:

> There are few places actually, where we don't take anything, we don't take any fauna, anything, we don't take any flower, or herbs, anything, we don't even touch any of that. These places are very sacred! We don't even take anybody there; we just go ourselves. But we saw some people in there and they take plants our and sell them. (TO7)

In the opinion of participants, frequent visits to Country, spending time on Country, enjoying leisure on Country through use and non-use activities (fishing, swimming, camping and/or bird-watching) and living on or close to Country represent not only opportunities to reconnect with Country and with cultural practices of land and water management, as observed in much of the previous research (Grice et al., 2012; Jackson et al., 2005; Maclean & Bana Yaralji Bubu, 2011; Morgan, Strelein, & Weir, 2004; Toussaint, Sullivan, Yu, & Mularty, 2001), but are also a way to reaffirm their identity and their long-term connection to Country in the face of an increasing non-indigenous population:

> I think another big problem in this area is all the houses that are built continuously, the population growth and the increased number of houses in the area. I don't know what will happen if more people sell their land and have subdivision and build their houses there, there will be even more people and we end up losing our identity. If we have rangers to look after our country, and people can see them, it shows that we are still there, we are not gone! (TO3)

Place attachment emerged as a solid basis, even today, for participants' sense of identity. Some participants discussed their frustration because current practices of giving language names have changed, which means some people in the community are unable to obtain a language name. This appears to be due to ancient practices no longer being carried out, and new protocols have not been clearly outlined and accepted by the community:

> I still don't have a language name. I tried to get one, but I couldn't. I tried to got to those people that could give me one, but maybe they don't know if they do it...anyway it did not happen so far. (TO1)

Many participants also expressed their frustration due to unaccompanied locals and tourists accessing cultural and special places without following the cultural protocol associated with those places, risking disrespect or ruining places of significance to the community by, for example, inadvertently trampling on burial sites or harvesting resources in sacred places.

4.1.3. Respecting tradition and the teaching of ancestors

Interviewees often spoke of the need to respect traditions and the teachings of ancestors, and to obey the precepts passed down from ancestors through the generations. Participants highlighted the importance of song, dance, ceremonies and stories for the transmission of knowledge to youth and the celebrations of connection to Country. They also reported that song, dance and ceremonies are nowadays carried out only sporadically, though some of the younger participants also expressed interest in the cultural restoration of those traditions:

> I have always danced, doing for a long time, and I would like to see a lot more happening in the community. That is how teachings and knowledge was passed to generations, I think is it very important ... it would be good do it with the Mulgrave river people. I do it when I go up in [named place] but I would like to do it with the traditional owners here. (TO17)

On the other hand, storytelling on Country is still widely practiced and stories play an important role in the transmission of environmental knowledge and ethical and social norms, similar to what has been observed previously (Jackson et al., 2005; Toussaint et al., 2005). For example, one story tells of the Mulgrave River being created by the rainbow snake, which escaped a storm in Lake Eacham. The story could be seen as encoded hydrologic knowledge of the connection between local surface and groundwater bodies, even if the understanding it reflects is not underpinned by scientific evidence. Another story tells of a cassowary that died while kicking his legs in different directions. The way the kicks were directed inspired rules for sharing of resources, and hence the story

seems to encode ethical and social norms on how to use river resources. Many stories tell of supernatural events, some of which happen when the rule "do not take too much" is broken, or when generally something wrong is said or done on Country. Such stories keep in place cultural and social norms for using river resources sustainably. Often, punishments are said to be inflicted on disobeyers by the spirits of ancestors, who are still looking after Country:

> There are very strong and sensitive places where if you fish too much or do or say other
> wrong things you get punished and stones come to you they get thrown at you. (TO15)

Storytelling takes place during visits to Country, usually while community members enjoy other leisure and subsistence activities. Historically purported walkabouts were traditionally conducted, where elders used to take young members away for a few days and walk and camp in the rainforest along the river, all the while telling stories and showing Country, and hence passing down the cultural knowledge of it. Participants said walking and staying on Country is still the preferred way to educate youth. Currently, "cultural camps" serve this purpose. Held during school holidays, the camps offer the additional benefit of being open to non-indigenous children, who can learn at least a part of the indigenous knowledge of Country. Despite this, many project participants suggested a lack of time to walk on Country was a limitation to the way Country is currently enjoyed and knowledge transferred to youth. Lack of time was discussed as a consequence of traditional owners having mainstream jobs to attend, as well as living away from Country, which is now protected in by national park status or else the private property of non-TO landlords:

> Well we would love to go back to country: for me the most important things would be
> go there, tell stories and take the youngster and the kids. But now how can we go to our
> country and take our kids if there is no country left and we don't have access to it? There is
> little water for us to swim, it is difficult to even swim, they think the canes need the water
> more than we do to swim! (TO12)

Other limitations offered included the overgrowth of rainforest across tracks and patches traditionally managed with fire, which impedes walking, and limited access to Country due to current land tenure and competing use of the area, for example, by tourists. Walkabouts and cultural trips are well known as the main way of sharing knowledge within indigenous traditions (Jackson et al., 2005; Maclean & Bana Yaralji Bubu, 2011; Toussaint et al., 2005). Moreover, participants pointed out that walking on Country is the preferred methodology for collaborative research on the ecological and social components of Country: one elder who took part in the project, and who was also acting as spokesperson for a group of male elders dwelling outside the study area, referred many times to the need for elders to take researchers on Country to show them their vision of it, and to better connect to Country and recall knowledge stored in their memory. The importance of such walking narratives is increasingly recognised in collaborative research on indigenous matters (Maclean & Bana Yaralji Bubu, 2011; Robinson & Wallington, 2012).

4.1.4. River and surrounding rainforest as sources of health and well-being

Most participants discussed the importance of having a physically and mentally healthy lifestyle. Many health problems were ascribed to a contemporary lifestyle and to poor diet that should, in the words of one participant, "contain a lot more bush tuckers". By contrast, living off resources of the river system and using traditional remedies from the bush were indicated as possible solutions. One participant recalled he treated his long-term symptoms of diabetes by living on Country, eating fish and bush tuckers and using traditional medicine:

> I got diabetes, and it took 16 years for me to get to the point the doctor told me I had to
> do something about it, so I went to live in the bush, and I lost 30 kg and now I don't have
> diabetes anymore. In the bush I live off fish, a lot of fish, yam, rice, taro and cassava, that I
> get from the Daintree and I eat a lot of fruits and vegies, and no meat. (TO14)

His declarations are corroborated by existing scientific literature which has, during the last 30 years, explored how the health of Australian Aborigines with chronic diabetes improves when resuming traditional practices of hunting and gathering due to both the physical exercise associated with those practices and the well-being coming from the fulfilment of "Caring for Country" responsibility, central to aboriginal worldview (O'Dea, 1991).

Soaking in water in specific healing places or in the river was referred to as the preferred treatment for a number of minor ailments, such as sores and limb pains, while soaking in specific places where small fish pick and clean dead skin was considered helpful in particular with skin sores. Health values of rivers and the potential for traditional medical remedies to be used today remain under-researched in Australia, possibly due to concerns for the protection of intellectual property rights related to traditional medicine.

Connection with the environment was discussed as a source of mental health and well-being. Some project participants referred to healing properties of locally caught fish which, when cooked in traditional ways, was used to alleviate the symptoms of minor illness and as a comfort food during recovery from surgery and confinement in hospital.

> I remember when I was sick in hospital, I had a surgery, but the only thing I could think about was "I want to go home" and I was longing to just go up the river and sit down close to a smoky fire. This is the only thing I could think of. Sitting along the river with a smoky fire and eat fish and rice, feel that feeling of belonging. Sitting in the water was traditionally used to heal. The fish from the river tastes different, and the reason for that is probably that is different! (TO6)

In addition, the social and spiritual dimensions of well-being were said to be enhanced through the relationship with Country. This relationship is nurtured by spending time on Country, for example, while enjoying recreational social activities, also observed in the literature (Jackson et al., 2005; Maclean & Bana Yaralji Bubu, 2011; Toussaint et al., 2005), and by respecting and venerating the ancestors who looked after Country in the past, and still do. In summary, for the study's participants, physical, mental and spiritual well-being were important holistically, and were maintained through consumption of natural resources and through recreational and spiritual dimensions of their relationship with the environment.

4.1.5. The economic value of the environment

Participants considered the environment as a provider of opportunities for environmentally and culturally sustainable livelihoods while Caring for Country, which in the opinion of some participants would confer a sense of freedom and independence. Most participants said the river and its resources support the community. Many use river resources for subsistence and they regularly extract fish, prawns and freshwater crayfish. Snakes, turtles, witchetty grubs and honey ants are also harvested but only sporadically or for transmission of cultural practices to youth. Determining the monetary value of subsistence use of the river was beyond the scope of this project, but other studies elsewhere in Australia have suggested it is high, especially for indigenous subsistence fisheries and for people relying on welfare payments (Busilacchi, Russ, Williams, Sutton, & Begg, 2013; Jackson et al., 2012, 2005; Maclean & Bana Yaralji Bubu, 2011; Maclean & Robinson, 2011; Toussaint et al., 2001, 2005). Furthermore, the river and its surroundings were considered to be economically valuable for the potential to create wages-based job opportunities, which participants identified as mainly ranger positions to undertake cultural and environmental monitoring and restoration along waterways, as also observed by Grice et al. (2012).

In addition to the customary river-based economy, participants identified river-based non-customary endeavours with the potential to provide future livelihoods for the community. Examples include cultural tourism and aquaculture for food production and river restoration, as well as marketing bush tucker and medicines:

> I envision a centre that is self-sufficient, without having to depend on grants. We should make it self-sufficient, with camp sites for tourists and fee that they pay, so we can keep [the site] clean. In the Goldsborough Valley at the moment there are lots of tourists who go there camping and rafting, but they leave a lot of rubbish behind, cans and broken bottles, and we don't have a way to monitor people who go in and out, so we should have a gate to count people and ask visitors, non-local visitors, for a fee. (TO1)

The potential for such indigenous economies has been identified and thoroughly discussed in other water-related research, especially in the works of Altman and Jordan (2008), Grice et al. (2012), Jackson et al. (2012), Maclean and Bana Yaralji Bubu, (2011) and Morgan et al. (2004). It is increasingly acknowledged that economic values for freshwaters should inform water allocation flows (Jackson et al., 2005; Maclean & Bana Yaralji Bubu, 2011; Morgan et al., 2004). Pursuing a river-based sustainable livelihood, especially if it involves spending time on Country, also represents an opportunity to reconnect with Country, and the health and social benefits associated with it have been widely documented in the literature (Burgess, Berry, Gunthorpe, & Bailie, 2008; Burgess, Johnston, Bowman, & Whitehead, 2005; Johnston, Jacups, Vickery, & Bowman, 2007; Weir, 2008). Project participants, however, always made the remark during interviews that jobs need to align with teaching from ancestors, be sustainable and not result in "raping the land" like the Europeans did. Ideally, such jobs would not require the traditional owners to move far away from their ancestral land. Often, participants hinted that they will be foregoing job opportunities that do not meet these criteria, and our participant observations confirmed this point.

4.2. Improving sustainability and justice through indigenous environmental values

Our research highlighted five guiding principles that drive the way the participant community's members think about the environment and act upon it and its resources. These five principles are:

(1) The environment is important because it is connected with the people, with present and past generations

(2) It is important to follow the teaching bestowed from ancestors, so as to respect traditions and take adequate care of the environment

(3) We are the environment and the environment is us: we are united and identify with nature

(4) Our health and well-being are intimately connected with the environment and dependent on it

(5) The environment provides sustenance, in terms of subsistence and wage-based activities, but we need to use it appropriately, and so in sustainable ways

These guiding principles inform the way our research participants look at and use the environment, what NRM activities they consider effective in sustaining these values, what they consider acceptable water management. Project participants derive their identity, sense of connection to their community, health and sustenance from the river, and more in general from their Country. NRM in the area should ensure their values for water are respected and kept in consideration in water planning. To be respectful of indigenous aspirations, water management should ensure that the Wet Tropics' traditional owners are enabled to continue to enjoy water in such a way.

The environmental values discussed by project participants during our research mostly fall into the altruistic/biospheric value type identified by Schwartz (1994). In our case study, these values appeared to be centred on the concept that human beings are an integral part of the natural world and hence subjected to the same natural rules that apply to plants, animals and unanimated features of the landscape; hence, they owe respect to the river and the surrounding rainforest. While economic uses of the water and its resources are important, economic benefits need to be extracted from the environment in a sustainable fashion.

Overall, our project participants' worldview appeared to have a central belief that the relation between human beings and the natural world should be one of respect, gratitude, acknowledgement of dependence and interconnectedness with animals, plants and other environmental features. Our results are similar to observations of many other indigenous traditions worldwide (Hawke, 2012; Kelbessa, 2005; Michell, 2005; Royal, 2012; Snodgrass et al., 2007; Voeller, 2011; White, 2010).

Sustainability is increasingly seen as a problem of human values. As the opening quote of this paper pointed out, what we need is a new perspective, a new way of looking at the natural world that would entail higher respect for it. Research has discussed the adoption of biospheric values as supporting this perspective and as pathways to sustainability (Axsen & Kurani, 2013; Banerjee, 2002; Clark et al., 2003; Gärling et al., 2003; Hawke, 2012; Mercer et al., 2005; Schultz & Zelezny, 1998; Teel et al., 2007; van Egmond & de Vries, 2011). A global tendency is in place where biospheric environmental values are increasingly observed; attitudes towards the environment of entire societies are changing (Callanan, 2010; Kopnina, 2012); water values are changing in this direction within Australian society as well (Jackson, Stoeckl, Straton, & Stanley, 2008). Australian indigenous people can be repositories of such values and perspectives on the environment, hence the restoration of their values in water management––and more in general in environmental management––will support Australian society's journey towards sustainability (Hawke, 2012). Our case study adds to the body of evidence that indigenous environmental values can promote a more spiritual and respectful relationship with the environment. We also point out how to present indigenous environmental values as human values, a change needed to overcome the cultural heritage paradigm and to strengthen the communication of indigenous priorities for management in co-management fora.

Restoring indigenous values for the environment would also enhance environmental justice. Indigenous people have been robbed of their land, dispossessed of their livelihoods, their values and vision for the environment have been marginalised. Grounding NRM in their values would return them dignity and would increase the general recognition of their culture. In many international fora, indigenous societies worldwide claim their environmental values are more sustainable than those associated with "western" capitalism, and their values and worldviews should be used as the foundation of more sustainable models of resource management and development (see, e.g. the United Nations Permanent Forum on Indigenous Issues, the Convention on Biological Diversity, the UNESCO Universal Declaration on Cultural Diversity, the International Summit on Indigenous Environmental Philosophy and the Declaration of the Rights of the Peoples and the Earth). Central arguments to these claims suggest indigenous worldviews and associated values promote an understanding of the human condition in terms of kinship and interdependence with other sentient and non-sentient elements of ecosystems. In this view, human actions should be aimed at the maintenance of balance within the natural world, whose limits in terms of capacity to provide must be respected for development to be sustainable (Royal, 2005, 2009, 2012). These arguments were reflected in project participants' statements, in which they showed an understanding of quality of life as provided through harmony with the environment, and acknowledged humankind's dependence on it, rather than materialistic possessions that derive from environmental exploitation. Indigenous environmental values, therefore, support sustainability by promoting reverence towards the environment instead of its commodification, and our case study contributes to the appreciation of indigenous perspectives on the man–environment relationship. We hope that, by the mean of this article, we give strength to the indigenous struggle to see their vision of caring for the environment restored.

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