

A PRELIMINARY EXPLORATION OF TOURISTS AS A KEY STAKEHOLDER IN CLIMATE CHANGE IMPACT MANAGEMENT.

ABSTRACT

This paper addresses climate change related issues that may affect the long term sustainable management of terrestrial and marine tourism protected areas in Cairns, Australia. The resiliency of tourism in areas vulnerable to climate change stands to be significantly affected by economic and societal trade-offs that may need to be made to protect valuable local-global resources for future generations. How do key stakeholders work towards the long-term conservation, use and enjoyment of a global heritage that is also a fragile ecological system facing multiple environmental threats and impacts? The role of tourists as key stakeholders in climate change is addressed, using a tourist survey undertaken at the domestic departure lounge of the Cairns International Airport. The questionnaire explored tourist perceptions related to climate change as well as some sustainability-oriented actions. The paper discusses the Climate Change Impact Model (Prideaux, Coghlan & McNamara, 2010) and the importance of including tourists as a key stakeholder in understanding options for adaptation.

KEY WORKDS

Climate change impact management, Great Barrier Reef, tourist knowledge, collaboration, World Heritage.

INTRODUCTION

In many parts of the world natural areas have emerged as key tourism resources. Threats to these areas have the potential to reduce tourism demand and seriously impact on community livelihoods. It is therefore essential that nature dependent destinations care for the environments that they rely upon. In some cases the nature of the care required may entail economic and societal trade-offs that could result in conflicts among local communities and tourism stakeholders particularly where livelihoods and well-being are adversely affected by such decisions. Following Scott, de Freitas & Matzarakis (2006), Jopp et al (2010) note that climate change adaptation for example cannot be undertaken effectively by discrete actor groups, but requires a sustainability-oriented approach where cooperation among diverse stakeholders and multiple adaptation strategies may be needed. Understanding the perceptions of key stakeholders, and incorporating their knowledge, values and interests in sustainable tourism planning is therefore a precondition for effective decision-making in sustainable destination management and adaptive planning under conditions of uncertainty and increased risk (see Jamal, 2013). In protected natural areas, ecotourism certified tour operators and tourists can both play a valuable role in policy making and adaptation at the destination level (see Becken & Hay, 2012; Gössling & Hall, 2006).

Protected areas that have World Heritage designations present additional challenges, as they are of social and cultural significance to stakeholders from the local to the global level, and often entail cross-sectoral governance and collaborative planning. Among the scant studies in this area is Scott, Jones and Konopek (2007), who explored climate change scenarios with a wide range of visitors in the mountainous landscapes of Waterton National Park, Canada (the joint Waterton Glacier International Peace Park is also a UNESCO World Heritage site) and Turton, Hadwen and Wilson (2009) who examined the climate-resource relationship and tourism at various Australian destinations, using an extensive multi-stakeholder process.

Farrell and Twining Ward's (2004) general framework of a "Complex Adaptive Tourism System" (CATS) illustrates the range of stakeholders and interests that intersected with human-ecological systems in tourism destinations. The development of complex adaptive tourism system models of this nature is especially important in nature based tourism destinations that are under increased pressures from environmental threats. As noted by other researchers (McKercher, Prideaux, Cheung & Law, 2010; Prideaux et al., 2010), it is also important to incorporate tourist knowledge and perceptions in environmental management particularly where climate change impact management is a major threat. The purpose of this paper is to:

- Examine the perceptions of tourists in relation to the impact of climate change on significant protected areas, in this case the Great Barrier Reef World Heritage Area (GBRWHA) and the Wet Tropics World Heritage Area (WTWHA), Australia.
- Examine the potential for the Climate Change Impact Model (CCIM) (Prideaux et al., 2010) to assist nature based destinations address climate change threats through adaptation.

The results reported below are preliminary and part of an applied project aimed to inform the tourism industry in Cairns, the major destination in the study area.

Climate change impacts in coral reef and coastal forest environments

The GBRWHA is over 1800 kilometers in length and has significant value for its biodiversity, value as a tourism resource and for the areas indigenous peoples, significant cultural values. Apart from

climate change the GBRWHA also faces a number of natural threats such as periodic cyclonic events and episodic invasion by the highly damaging Crown of Thorns starfish as well as a number of human generated threats including poor water quality from catchment runoff, loss of coastal habitats from coastal development, increased shipping and related dredging/silting from industrial expansion along the coast and occasional oil spills from vessels running aground (see Great Barrier Reef Outlook Report, Great Barrier Reef Marine Park Authority (GBRMPA), 2009). In the future climate change is expected to become a major issue. Increases in water temperatures above 2°C is expected to have severe implications for the health of coral reefs and fisheries while increased acidity is expected to have an adverse impact on many marine organisms.

Reef degradation poses a serious risk to the marine tourism industry, with coral reefs under threat worldwide from climate change as well as other challenges such as detrimental fishing practices (e.g., overfishing), coastal development, land and marine-based pollution, etc. (<http://www.iucnredlist.org>, accessed October 8, 2010). The costs range from environmental to social and economic. Reef health, including the impacts of coral bleaching, is seen to be important to the experience and satisfaction of dive tourists. A 30% loss of corals resulting in reduced tourism off the coast of Kenya (Mombasa) and Tanzania (Zanzibar) and created economic losses of about US\$12–18 million (Payet & Obura, 2004, cited in Hall, 2008). Study of coralline beaches and ecotourism in the Dominican Republic indicates that current rates of beach erosion could result in significant revenue losses to the hotel industry, but if corals continue to die off, beach erosion and hence tourism revenue loss will be substantially higher.

In addition to their biodiversity value, protected areas can be of immense historical and cultural significance as is the case with the WTWHA. Located in the north-east coastal zone of Queensland and encompassing an area of 894,000 hectares the area was inscribed on the World Heritage list in 1988 in recognition of its outstanding natural universal values. The rainforest contains an almost complete record of the major stages in the evolution of plant life on earth with many of the rainforest species originating when Australia was still part of Gondwana. It is a region of rugged topography, spectacular scenery, rainforest vegetation communities and waterfalls.

Following Scott et al. (2006), Jopp et al (2010) note that climate adaptation cannot be undertaken effectively by discrete actor groups, but requires a sustainability-oriented approach where cooperation among diverse stakeholders and multiple adaptation strategies may be needed (see Becken & Hay, 2012). The development of well-integrated, collaborative planning, policy making and impact management approaches is especially important as, in addition to various ecological and biodiversity issues, resiliency planning must address the social and economic trade-offs that will be needed, and the potential associated societal conflicts. This requires multi-stakeholder involvement and engagement, as well as understanding and addressing their interests, values and priorities in relation to tourism, environment and climate change.

Too little is understood of the role that key stakeholders such as tourists may contribute to environmental conservation in the face of threats related to climate change. Understanding and addressing risk perceptions of tourism providers and tourists is an emerging area of research (see McKercher et al., 2010). The following study provides a brief exploration of tourists and their views on climate change in general and how it may affect WHAs in the study area.

METHODS

The data reported below was gathered from tourists at the Cairns International Airport in 2012 between July-September 2012 (n=368). The language of the questionnaire was English and

therefore the sample was limited to tourists who can read and write in English. Passengers at the domestic airport included both domestic and international tourists. The survey addressed a number of marketing and climate change issues related to tourist motivation (e.g., how coral bleaching influences decision making of domestic and international tourists; how tourists related to the World Heritage brand, etc.). The relationship between education and climate change concerns and action was also explored, along with gender effects. Other questions explored the importance of the World Heritage brand to tourists visiting the study region, concerns about climate change impacts on the Great Barrier Reef (GBR) and awareness of climate change influence sustainability action at home and away?

Closed and open-ended questions were used to gather data on socio-demographic information, motivations for visiting the region, activities undertaken, plus issues related to climate change and sustainability. Closed-ended responses were based on nominal as well as ordinal data, which were analyzed using SPSS 20 statistical software. A 1 to 5 Likert scale was on closed questions. Nonparametric tests were used to test the closed responses as the data was distribution-free and ordinal and nominal in nature. Open-ended responses were analyzed through content analysis. Care should be taken in generalizing these results over a larger population.

RESULTS

Demographic overview

The sample consisted of 51.5% males and 48.5% female. Respondents originated from both Australia (53%) and overseas (47%). International tourists originated mainly from the Europe (28.6%) which included UK and Ireland (10.9%) plus Germany (3.8%), as well as North America (11.2%). Ages ranged from 19 to 85 years old. The main age groups of respondents for this period were: 20–29 years (24.1%), followed by 50–59 years (20.5%), 30–39 years (12.9%) 40–49 years (12.9%), 60–65 years (9.9%) and under 20 years (8.6%). A majority of respondents (43.2%) reported that they had received a degree or higher university qualification, finished secondary education (21.3%), had a diploma (16.7), a trade or TAFE qualification (10.7%) or other kinds of education (8.1%). A good proportion was employed as professionals (25.1%), students (18%), or retired/semi-retired (16.1%). Other occupations included public service (8.7%), self-employed (8.2%), management (6.6%), tradesperson (5.5%), clerical (3.6%), domestic duties (2.7%), service industry (2.5%), retail (2.2%) and manual/factory worker (0.8%).

Recognition and importance of World Heritage designations in the Cairns region

Approximately half of the respondents (51.2%) reported that they noticed World Heritage designated sites in the Cairns region. They were asked to name the World Heritage sites they noticed; open-ended responses were categorized under GBR or grouped under other significant heritage areas (which included the rainforests of the WTWHA). The table below shows that about a third of respondents who noticed a World Heritage Area (WHA) in the region named either or both sites in their responses. The results indicate that the GBRWHA (31.9%) is slightly better recognized by the respondents than the WTWHA (28.5%). Overall however, results indicate a surprisingly poor recognition of the World Heritage brand despite the fact that region's main selling proposition is based on two World Heritage properties.

Table 1: Recognition of World Heritage designations in the Cairns region

Area	%
GBR	22.6
Reef	9.3

Total of GBR related responses	31.9
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It would appear, however, that the World Heritage status may not greatly affect tourism visitation to Cairns. When asked if they would still have made this trip to Cairns if the GBR lost its World Heritage status, a high percentage of tourists responded affirmatively (Yes 84.2%/ No 15.8%).

Booking tours that have environmental accreditation

Respondents were asked if they have a preference to book tours that have environmental accreditation. Nearly half (46.4%) answered “depends,” 22.8% answered “Yes” and 30.8% answered “No.” The probability that a person prefers to book an environmentally accredited tour appears to depend on their level of education. Respondents who have a diploma or better in terms of formal education are significantly more likely to prefer to book such tours than those with less formal education (52.2% vs. 26.3%; $p=0.02$).

Table 1: Education level vs. Book environmentally accredited tours

Book Environmentally Accredited Tours	Secondary	Trade/TAFE	Diploma	Degree	Other Education
Yes	29.0%	23.1%	53.3%	54.2%	38.5%
No	71.0%	76.9%	46.7%	45.8%	61.5%

Knowledge about climate change and booking environmentally accredited tours

Respondents were asked to rate their own level of knowledge about climate change. More than half of the respondents (59.7%) reported that they have “some” knowledge about climate change followed by “little” (23.6%). Only 13.4% considered that they have “high” knowledge about climate change and 3.4% reported that they had “no” knowledge about climate change. There was no significant difference in their response across gender ($p=.179$), origin ($p=.566$), generations ($p=.472$) or educational back ground ($p=.105$).

Even though there wasn't a statistically significant difference between climate change knowledge and preference to book tours that have environmental accreditation, it is clear from the table below that those who felt they had a high degree of climate change knowledge were more likely to book a tour that is environmentally accredited. Only 11.1% of those who claim to have no climate change knowledge prefer to book such tours compared to 52.2% of those with a self-professed high level of knowledge on climate change.

Table 2: Preference to book environmentally accredited tours vs. Perceived climate change knowledge

Book Environmentally Accredited Tours	Perceived Climate Change Knowledge			
	High	Some	Little	No
Yes	52.2%	47.7%	31.4%	11.1%
No	47.8%	52.3%	68.6%	88.9%

Concern about climate change impacts

Respondents were asked how concerned they were that climate change will damage the GBR (Mean 3.21). Respondents expressed concern about the impact of climate change on the GBR (Table 5). There was a significant difference in responses between genders, ($x^2_3, N = 343$) = 13.738, $p=.003$. Females reported significantly higher concerns (Not all concerned, 3%, A little concerned 10.8%,

Concerned 34.7% and Very concerned 51.5%) than males (Not all concerned, 4.5%, A little concerned 15.9%, Concerned 47.7% and Very concerned 31.8%). Chi square test for independence did not detect significant differences based on origin ($p=.682$). The sample is too small to test significance within age groups or educational background.

Table 5: Concern about climate change impacts on the GBR

Not at all concerned	3.7%
A little concerned	13.1%
Concerned	41.9%
Very concerned	41.3%

Concern about climate change on the rainforest

Respondents were asked about their level of concern about possible climate change impacts on the Wet Tropics Rainforest (Mean 3.17). Female expressed significantly higher concerns towards the impact of climate change on rainforest, $\chi^2(3, N=343) = 7.883, p=.048$. Females reported significantly higher concerns (Not all concerned, 3%, A little concerned 12.6%, Concerned 37.1% and Very concerned 47.3%) than males (Not all concerned, 5.1%, A little concerned 17.6%, Concerned 44.3% and Very concerned 33%). Chi square test for independence did not detect significant differences based on origin ($p=.497$). The sample is too small to test significance within age groups or educational background.

Table 6: Concern about rainforest impact

Not at all concerned	4.0%
A little concerned	14.8%
Concerned	41.0%
Very concerned	40.2%

Concern about extinction of animals

Respondents were also concerned about the impact of climate change that it may lead to the extinction of some Australian animals (Mean 3.22). Female respondents expressed significantly higher concerns towards the extinction of Australian fauna, $\chi^2(3, N=343) = 8.408, p=.038$. Females reported significantly higher concerns (Not all concerned, 3%, A little concerned 10.1%, Concerned 36.3% and Very concerned 50.6%) than males (Not all concerned, 5.7%, A little concerned 17.1%, Concerned 40% and Very concerned 37.1%). Chi square test for independence did not detect significant differences based on origin ($p=.435$). The sample was too small to test significance within age groups or educational background.

Table 7: Concern about wildlife extinction

Not at all concerned	4.3%
A little concerned	13.4%
Concerned	38.7%
Very concerned	43.6%

Deterrents to visitation: Coral bleaching event

Close to a third of all respondents reported that they would still have visited Cairns even if the GBRWHA was affected by a major coral bleaching event (described in the questionnaire as when the coral dies because of high water temperatures). 19.7% answered “no” and more than half (50.7%) reported they would not have come to Cairns in the event of a major coral bleaching of the

GBRWHA. We did not observe significant difference in the reaction between genders ($p=.808$). Significant difference was found only in regard to the origin of the respondents, $\chi^2(2, N=228) = 8.753, p=.013$. The result indicates that international respondents are less likely to visit Cairns if a major coral bleaching occurred. 13.2% of domestic and 23.4% of international respondents expressed that they would not have visited and 39.6% of domestic and 22.6% international reported that it would not have affected their decision to visit Cairns. About half of both domestic (47.3%) and international respondents (54%) responded “maybe.” The sample size was too small to test age group and educational background.

Making a meaningful contribution to reduce the impacts of climate change

Respondents were asked if they believe they can make a meaningful contribution to reducing the impact of climate change. The majority felt they were trying to do so (61%); only 16% felt it was too big or too difficult an issue. The sample was too small for significance tests.

Table 8: Making a meaningful contribution to climate change impact management

No, too big/too difficult	16.3%
Possibly	12.8%
Yes sometime	9.9%
Yes trying	61.0%

DISCUSSION

The tourism literature to date has focused on translating the results of scientific based climate change research into assessments of its impact on how the tourism industry may respond. Far less attention has been paid to ethical issues (Becken, 2013), and to consumer responses (Gössling, Scott, Hall, Ceron & Dubois, 2012). In addition, the urgencies of climate change in the 21st century indicate that much greater research attention needs to be devoted to the following two aspects: (i) mechanisms for closer collaboration between the scientific community and the tourism industry to enable effective adaptation and other climate change impact management actions, and (ii) better understanding of the roles and responsibilities of the visiting public who are, of course, tourists in the destination and residents within civil society in their home world. As climate change is both a local and global issue, this particular stakeholder group may be able to play far more significant role than has been attributed to them. This has both strategic implications for tourism industry adaptation (Gössling et al., 2012), as well as ethical ramifications (see Becken, 2013) such as addressing climate change in developing nations. An urgent need therefore exists to develop effective approaches to the management of climate change that address both the content and the process of collaborative participation by key stakeholders groups in the tourism system (see Faulkner, 2001, for example).

Prideaux et al. (2010) developed a framework to assess the impact of climate change on the WTWHA in Queensland, Australia, based on a synthesis of scientific investigations of climate change impacts in the region, plus discussions with managers, planners, scientists and tourism operators involved with the WTWHA. The CCIM integrates science, supply (defined as landscapes, ambient temperature and scenic views) and demand (for tourism experiences) over six stages. The relationships at each stage of the model and linkages that might otherwise go unnoticed are intended to better inform planning and development of adaptation strategies. While the model is conceptually based on standard economic demand and supply theory plus the concept of consumer push and destination pull, their discussion focused on the former and advocated future attention to the latter. As these authors explain, a key strength of the framework is its ability to illustrate linkages between

various elements of the physical and human systems operating in the mountain tourism system (Prideaux et al., 2010). Their framework and the stages shown may be usefully adapted to include marine WHAs like the GBR as well as terrestrial WHAs, as shown in Figure 1.

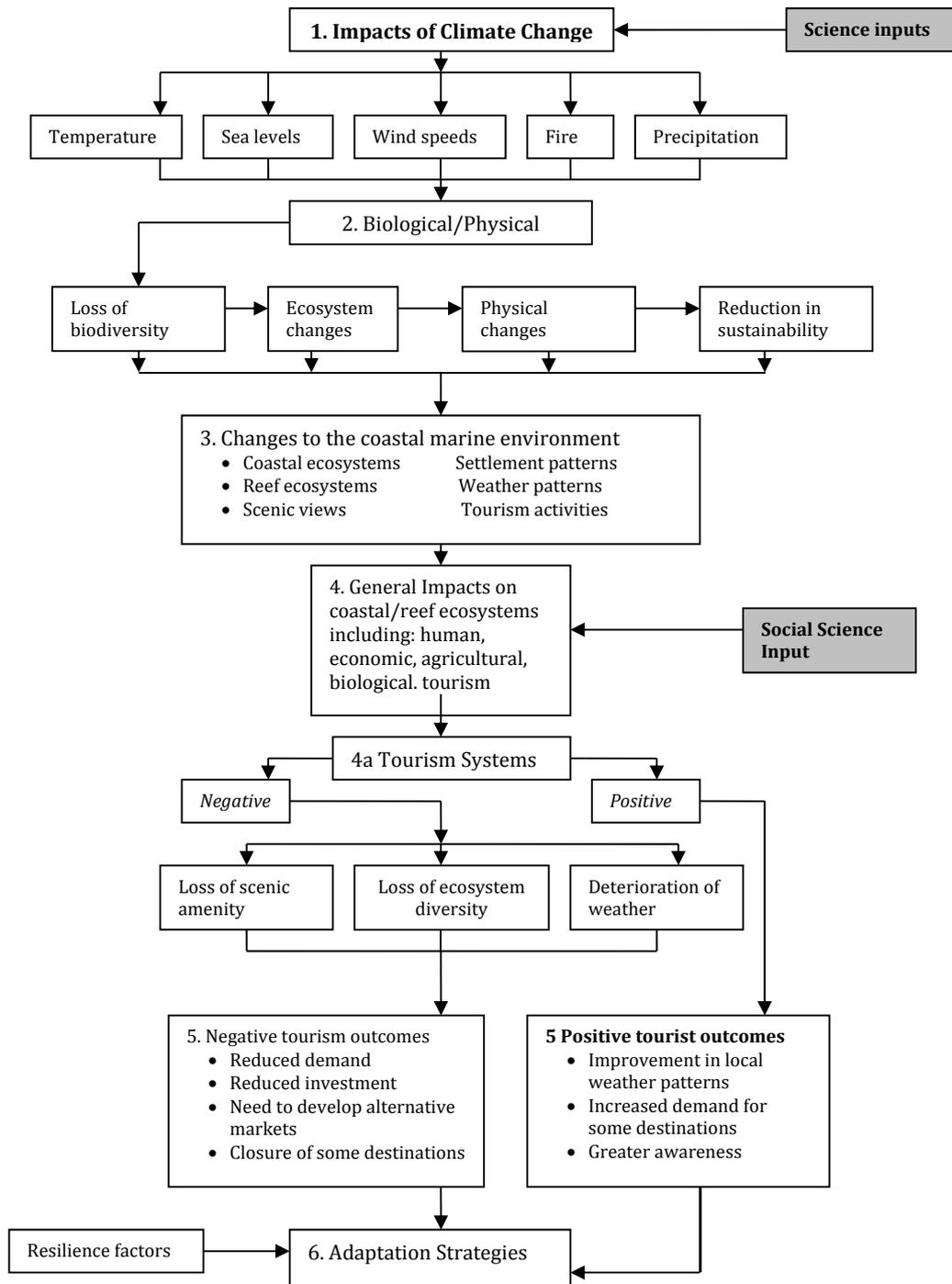


Figure 1: The six step Climate Change Impact Model (CCIM) adapted to coastal and coral reef destinations (adapted from Prideaux et al., 2010).

Stages 5 and 6 in Figure 1 are especially important for the purpose of this discussion, as they related directly to possible range of tourism impacts and potential for adaptation. This is where studies on tourist knowledge, perceptions, behavior and actions can be inputted to assess future travel patterns and other potential outcomes, as well as determine optimal adaptation strategies. In the context of the GBRWHA tourist survey presented earlier, the following illustrate the value of incorporating such tourist data.

- 1) The survey indicates that tourists are concerned about climate change impacts on the two World Heritage Areas in the study location and about the loss of Australia fauna. Respondents, particularly female tourists, expressed serious concern about climate change impacts on the Great Barrier Reef, and were more concerned about this than climate change impacting on their own quality of life. Incorporating tourist information on the level of concern about climate change impacts on protected areas may offer avenues for destination managers, tourism service providers and policy makers to address these concerns.
- 2) The survey results indicate that the level of tourist education and knowledge are important factors with respect to engaging in sustainable practices such as purchasing environmentally certified tours. Aided by this information as well as scientific information, and the participation of key stakeholders such as the GBRMPA, information could be used to develop sustainable practices at the destination as well as identify carbon management actions that tourists could engage in after returning home. As the survey indicates, the majority of tourists surveyed felt they were trying to engage in meaningful action on climate change. This could be included in operationalizing step 6 of the CCIM.
- 3) The results indicate that awareness raising, sustainability education and collaborative involvement of tourists in co-creating environmentally friendly tools and strategies, should be considered as part of a wider effort to more actively engage tourists in climate change adaptation (see Gössling, Haglund, Kallgren, Revahl & Hultman, 2009 on co-creating carbon offset tools).
- 4) Information on tourist knowledge, perceptions and behaviors (intentions and actions) could be valuable for designing useful interpretive materials and strategies for use on boats and in visits in the WTWHA. Part of the learning may include information identifying the Wet Tropics and the GBR as WHAs and what this means in terms of civic responsibilities to sustain these for future generations. Despite strong efforts to brand these two WHAs, only half the survey respondents seem to recognition these World Heritage listings. Wider dissemination and discussion on the roles and responsibilities associated with this listing is needed for both residents and tourists.

The range of ethical positions and perspectives on air travel and on climate change observed in the research literature simply add further support to the need for greater awareness raising and information dissemination among tourists. Higham and Cohen's (2011) study showed that Norwegian travelers concerned about their contribution on climate change continued to engage in "air travel with a carbon conscience." While much further research is needed on the relationship between concern and action, studies like Higham and Cohen (2011) suggest that concerned travelers do attempt to engage in sustainability-oriented actions. Their study comports with Gössling et al.'s (2009) research but contrasts with Hares, Dickinson and Wilkes (2010), whose UK study showed climate denial coupled with reluctance to change travel behavior. However, all studies acknowledge an information deficit, as observed by Hares et al., 2010 (see also Becken & Hay, 2012). Hence, tourists who are aware of and concerned about climate change impacts could be a potential resource

to support, and should be considered as potentially valuable participants in the CCIM. One broad hypothesis for future research that this study raises is: Climate change in World Heritage Areas like the GBR and Wet Tropics requires collaborative action based on the diverse knowledge, concern and involvement of multiple stakeholders from the local (residents, local government and local tourism industry) to the global (UNESCO, international tourists, international organizations, major airlines and hotel chains).

CONCLUSIONS AND DIRECTIONS FORWARD

Weaver (2011, p. 5) notes among the challenges related to the contemporary state of knowledge about tourism and climate change, an “apathetic and fickle travelling public and a reciprocally uncommitted tourism industry.” What is puzzling is the apparent gap in the literature about the role of tourists in climate change impact management and adaptive planning (see also Hall, 2008; Becken & Hay, 2012). Might tourists not become potentially engaged members of civic society and the public sphere, actively pursuing sustainability actions and behavior change due to learning and experience from the destination visited? Does knowledge of and concern about climate change mediate their preferences and actions on site and away?

The fragmented, multi-scale, highly political nature of the tourism system (Farrell & Twining Ward, 2004) indicates that one of the most challenging problems that face local businesses is collaborative planning based on multi-stakeholder knowledge, perspectives, interests and actions in climate change impact management. Climate change impact models can be usefully informed by incorporating the roles, perceptions and values of key stakeholders in relation to climate change and environmental sustainability. Of these, the tourist is a key stakeholder, yet poorly incorporated into such models. Better understanding of the knowledge, perceptions and values of tourists in destinations like Cairns may be especially helpful to tourism industry stakeholders when developing improved adaptation strategies. Such collaborative involvement of key stakeholders, including tourists, could be greatly useful, for instance, in:

- adaptation planning;
- scenario-based planning;
- developing monitoring strategies, adaptive capacity, and facilitating institutional response for mitigation;
- stakeholder involvement in resiliency planning and decision making (Jamal, 2013);
- resource conservation and management in tourism, and in biodiversity conservation (see, for example, Queensland Conservation: Nature Conservation and Biodiversity Strategic Plan July 2008); and
- education and interpretation.

ACKNOWLEDGEMENTS

We would like to acknowledge the Cairns Institute, James Cook University, Australia, for visiting fellowship support (2012) that contributed towards the development of this conference paper, the National Environmental Research Program (NERP) for funding the research, and Brian Smith for assistance in data organizing and processing.

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