

Addressing water scarcity in the Japanese tourism sector: A pro-environmental behaviour approach

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Abstract

Freshwater availability continues to decline as climate change renders water resources to progressively become limited. Japan is forecasted to experience extremely severe water shortages in key tourism destinations such as Tokyo, Osaka, and Wakayama in the next few years. Therefore, this short communication discusses future research needs by addressing current issues surrounding water sustainability in the Japanese tourism sector and proposing a pro-environmental behaviour approach. Specifically, this communication paper establishes the importance of national culture as a key factor influencing pro-environmental behaviour amongst tourists and hosts. The proposed research will enhance theoretical knowledge by incorporating the role of Japanese culture in shaping behavioural change towards water conservation in tourism while strengthening industry practice through a water-saving intervention. As tourism is a key contributor to the United Nations Sustainable Development Goals (SDG), pursuing this research area will directly contribute to SDG6, “Clean water and Sanitation”.

Keywords

Pro-environmental behaviour
National culture
Water
Sustainability
Cultural dimensions

Water and tourism

Freshwater availability has been declining in the last few decades (FAO, 2020; UNESCO & UN-Water, 2020). The climate breakdown will make water resources even more scarce (Intergovernmental Panel on Climate Change [IPCC], 2021; Rodell et al., 2018) and the tourism sector is not free from guilt. Moreover, the tourism sector is likely to suffer from scarce water resources, as many relevant destinations are in water-sensitive areas like the littoral, islands, or developing countries, where freshwater is also demanded by agriculture, hydro-electricity production, or the locals, to name just a few. Let us remember the so-called *Day Zero* that occurred in 2018 in South Africa with millions of inhabitants on the verge of running out of water; the tourism sector also suffered (Dube et al., 2020). Specifically, it is estimated that tourism accommodations use around 350 litres of water per guest and night (Gössling, 2015). Despite the high tourism dependency on water resources and its likely damaging environmental impact, tourism literature is still scarce on this subject (Antonova et al., 2021; Cole et al., 2020; Moyle et al., 2021), notwithstanding the calls made some years ago (Gössling et al., 2012; Warren & Becken, 2017). This short communication aims to briefly explore the current issues surrounding water sustainability in tourism accommodations, with a focus on Japan, and discuss future research and actions.

Japan's water crisis

Japan is amongst the leading countries prioritising effective water management and has demonstrated this through the aid of policies, technologies, and governmental systems (MLIT, 2019). Nonetheless, serious water concerns remain, due to deteriorating infrastructure, population decline and the rising frequency of natural catastrophes. Owing to these problems,

over 90% of Japan's water utilities are forecasted to increase price rates by an average of 36% by 2040 (Nippon.com, 2020). Additionally, global reports suggest that even in an optimistic scenario, Japan will face high water stress (i.e., water shortages) by 2030 (Hofste et al., 2019; WRI Aqueduct, 2019), as shown in Figure 1. Some of the most popular tourism destinations in Japan such as Kobe and Wakayama (with 21.6 million domestic visitors collectively in 2020) will experience high water stress while Tokyo, Osaka, Okinawa (with 52.6 million domestic visitors collective in 2020) will face extremely high-water stress (Statista, 2021; WRI Aqueduct, 2019). This



Figure 1. Optimistic scenario of Japan water risk in 2030. Source: WRI Aqueduct, 2019 (WRI Aqueduct, 2019). CC BY 4.0.

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will create a dilemma of how much water should be used by tourism accommodations in these destinations. Therefore, we suggest a dire need for greater research to inform adequate behavioural interventions to reduce water usage in tourism.

Pro-environmental behaviour for water conservation

The overall management of water has been mostly focused on what businesses and manufacturers (can) do to reduce consumption (i.e., technical solutions such as using aerators or low-flow showerheads). A similar approach was followed in tourism accommodations, despite the evidence that human behaviour is part of the environmental crisis and, therefore, must be part of its solution (Amel et al., 2017). Little research in tourism has looked at how guests/employees consume water and the potential of nudging people to behave more pro-environmentally (Correia Loureiro et al., 2021; Han et al., 2020; Warren & Becken, 2017). Pro-environmental behaviour, defined as any behaviour that lessens its negative environmental impacts (Steg & Vlek, 2009), is suggested to be the result of the interplay between psychological factors, both cognitive and emotional (Han et al., 2020), contextual influences, and habits (Klößner, 2015). Accounting for these three key aspects in behavioural interventions can lead to a successful behavioural change (e.g., Pereira-Doel et al., 2022), even in highly hedonic contexts like tourism (Dolnicar, 2020). Moreover, these antecedents of pro-environmental behaviour change from person to person, hence, they need to be considered to optimise the interventions (Untaru et al., 2020). More interventions are, thus, encouraged in tourism contexts (Correia Loureiro et al., 2021; Viglia & Dolnicar, 2020) exploring the factors that can better lead to pro-environmental behaviour.

Pro-environmental behaviour and Japanese culture

While pro-environmental studies are steadily gaining momentum in tourism and hospitality, most studies exclude the role of national culture, despite culture being demonstrated to influence visitor decisions (Filimonau et al., 2018; Woodside et al., 2011). Hofstede et al. (2010, p. 6) indicate that culture is “the collective programming of the mind which distinguishes the members of one group or category of people from others”. Tourists from similar cultures are more likely to demonstrate similar decision-making as one’s culture is considered as the “patterns of sensemaking materialized in actual practices, everyday lives and societal institutions” (Komatsu et al., 2019, p. 2). Therefore, tourists’ national culture is a useful contextual influence to better understand the drivers and motivations which could support and encourage pro-environmental behaviours in tourism.

Various theoretical frameworks have been developed to understand national cultures and behaviours. Hofstede’s Cultural Dimension is one of the most widely used frameworks which identifies six dimensions of national cultures: power distance (the degree of power distribution), individualism (the extent of considering individual versus community interests), masculinity (the degree of emphasis on materialistic objectives), uncertainty avoidance (the degree of tolerance towards ambiguity), long term orientation (the degree of maintaining past traditions) and indulgence (the extent that society controls/regulates gratification relating to life enjoyment) (Hofstede et al., 2010). As an example, Figure 2 shows the comparison of the Japanese national culture against the western cultures of the United Kingdom (UK) and United States (US), based on Hofstede Insights (n.d.). The UK and the US are selected because they are typical Western contexts

reflected in tourism literature on pro-environmental behaviour.

As Figure 2 reflects, there are stark differences between Japanese and Western cultural dimensions. The Japanese have a lower individualistic orientation as they prioritise the harmony of the group rather than the individual interests when making decisions. There is a high-power distance compared to the UK and the US, indicating that Japanese society is more inclined towards a hierarchical order. Interestingly, the masculinity dimension suggests a higher degree of achievement and competitiveness in Japanese culture. Additionally, Japanese culture is highly avoidant of any ambiguity when making decisions. That may also explain the strong sense of long-term orientation, indicating that the Japanese society prefers to maintain traditions and norms, and is uncomfortable with societal change that threatens those traditions. Following from previous dimensions, the Japanese culture is more inclined to suppress their hedonic gains to, instead, follow their social norms.

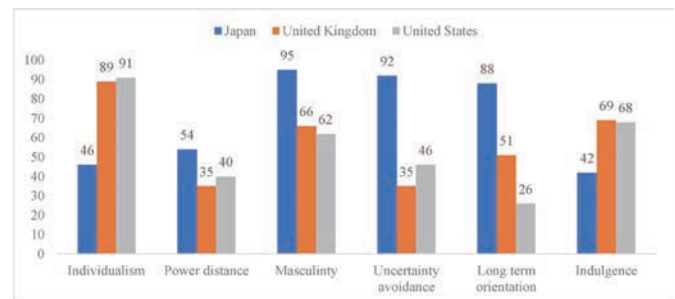


Figure 2. Comparing Hofstede’s cultural dimensions between Japan, UK, and US. Source: Hofstede Insights, n.d.

This comparison between Western and Japanese cultures also suggests differences in pro-environmental behaviours. Past research has predominantly explored pro-environmental behaviour from the individualism dimension. For example, cultures with more individualistic values place less importance on pro-environmental behaviours (Komatsu et al., 2019). Moreover, Komatsu et al. (2019) suggest that people in individualistic societies are less likely to believe that human activities contribute to environmental problems. Furthermore, while culture has been widely used to understand pro-environmental motivations and behaviours in a company, the topic of pro-environmental behaviours and national culture in tourism is still in its embryonic stage (Filimonau et al., 2018). Most research has explored a Western context (i.e., UK, Norway, and Poland) (Filimonau et al., 2018; Hares et al., 2010; Higham & Cohen, 2011). Thus, we suggest that specific research and behavioural interventions are needed to better understand the cultural influence on pro-environmental behaviours in Japan by, parallelly, addressing the water scarcity challenge.

Conclusion

Freshwater availability continues to be a grave concern globally. The tourism sector will likely be affected particularly in water-sensitive areas, and therefore, further insights into pro-environmental behaviour and water savings are required. Although pro-environmental behaviour studies have been widely investigated within the business management literature, this topic is underdeveloped in tourism. In addition, little is known about how pro-environmental behaviours are influenced by the national culture of Japanese tourists and

hosts. This communication paper suggests that culture is an influencing contextual factor in determining pro-environmental decision making and therefore, requires further research within the tourism context. Such research would bring theoretical and practical implications. Well-known cultural frameworks developed by Hofstede et al. (2010) provide a starting guideline in exploring this phenomenon within the tourism context. Moreover, research on pro-environmental behaviour and water savings in tourism is in line with the United Nations Sustainable Development Goals (UNWTO, 2018), in particular Goal 6, which aims to ensure the availability of clean water and sanitation. Tourism is considered a key sector in protecting water resources. As Japan will be facing an extremely high-water crisis in key tourism destinations, understanding the Japanese culture and the ways in which pro-environmental behaviours could be encouraged will help ease and mitigate this crisis.

References

- Amel, E., Manning, C., Scott, B., & Koger, S. (2017). Beyond the roots of human inaction: Fostering collective effort toward ecosystem conservation. *Science*, 356(6335), 275-279. <https://doi.org/10.1126/science.aal1931>
- Antonova, N., Ruiz-Rosa, I., & Mendoza-Jiménez, J. (2021). Water resources in the hotel industry: A systematic literature review. *International Journal of Contemporary Hospitality Management*, 33(2), 628-649. <https://doi.org/10.1108/IJCHM-07-2020-0711>
- Cole, S. K. G., Mullor, E. C., Ma, Y., & Sandang, Y. (2020). "Tourism, water, and gender"—An international review of an unexplored nexus. *WIREs Water*, 7(4), e1442. <https://doi.org/10.1002/wat2.1442>
- Correia Loureiro, S. M., Guerreiro, J., & Han, H. (2021). Past, present, and future of pro-environmental behavior in tourism and hospitality: A text-mining approach. *Journal of Sustainable Tourism*, 30(1), 1-21. <https://doi.org/10.1080/09669582.2021.1875477>
- Dolnicar, S. (2020). Designing for more environmentally friendly tourism. *Annals of Tourism Research*, 84, 102933. <https://doi.org/10.1016/j.annals.2020.102933>
- Dube, K., Nhamo, G., & Chikodzi, D. (2020). Climate change-induced droughts and tourism: Impacts and responses of Western Cape province, South Africa. *Journal of Outdoor Recreation and Tourism*, 100319. <https://doi.org/10/gn73sx>
- FAO. (2020). *The State of Food and Agriculture 2020*. FAO. <https://doi.org/10.4060/cb1447en>
- Filimonau, V., Matute, J., Mika, M., & Faracik, R. (2018). National culture as a driver of pro-environmental attitudes and behavioural intentions in tourism. *Journal of Sustainable Tourism*, 26(10), 1804-1825. <https://doi.org/10.1080/09669582.2018.1511722>
- Gössling, S. (2015). New performance indicators for water management in tourism. *Tourism Management*, 46, 233-244. <https://doi.org/10.1016/j.tourman.2014.06.018>
- Gössling, S., Peeters, P., Hall, C. M., Ceron, J.-P., Dubois, G., Lehmann, L. V., & Scott, D. (2012). Tourism and water use: Supply, demand, and security. An international review. *Tourism Management*, 33(1), 1-15. <https://doi.org/10.1016/j.tourman.2011.03.015>
- Han, H., Chua, B.-L., & Hyun, S. S. (2020). Eliciting customers' waste reduction and water saving behaviors at a hotel. *International Journal of Hospitality Management*, 87, 102386. <https://doi.org/10.1016/j.ijhm.2019.102386>
- Hares, A., Dickinson, J., & Wilkes, K. (2010). Climate change and the air travel decisions of UK tourists. *Journal of Transport Geography*, 18(3), 466-473. <https://doi.org/10.1016/j.jtrangeo.2009.06.018>
- Higham, J. E. S., & Cohen, S. A. (2011). Canary in the coalmine: Norwegian attitudes towards climate change and extreme long-haul air travel to Aotearoa/New Zealand. *Tourism Management*, 32(1), 98-105. <https://doi.org/10.1016/j.tourman.2010.04.005>
- Hofste, R., Kuzma, S., Walker, S., Sutanudjaja, E., Bierkens, M., Kuijper, M., Faneca Sanchez, M., Van Beek, R., Wada, Y., Galvis Rodríguez, S., & Reig, P. (2019). Aqueduct 3.0: Updated Decision-Relevant Global Water Risk Indicators. *World Resources Institute*. <https://doi.org/10.46830/writn.18.00146>
- Hofstede, G. H., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind: intercultural cooperation and its importance for survival* (3rd ed). McGraw-Hill.
- Hofstede Insights (n.d.). *Compare countries*. <https://www.hofstede-insights.com/product/compare-countries/>
- Intergovernmental Panel on Climate Change [IPCC]. (2021). *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Intergovernmental Panel on Climate Change (IPCC). <https://www.ipcc.ch/report/ar6/wg1/#outreach>
- Klößner, C. A. (2015). *The psychology of pro-environmental communication: Beyond standard information strategies*. Palgrave Macmillan. <http://www.palgraveconnect.com/doi/10.1057/9781137348326>
- MLIT. (2019). *White Paper on Land, Infrastructure, Transport and Tourism in Japan 2019*. Ministry of Land, Infrastructure and Transport and Tourism. <https://www.mlit.go.jp/common/001113571.pdf>
- Moyle, B. D., Weaver, D. B., Gössling, S., McLennan, C., & Hadinejad, A. (2021). Are water-centric themes in sustainable tourism research congruent with the UN Sustainable Development Goals? *Journal of Sustainable Tourism*, 1-16. <https://doi.org/10/gm9c9j>
- Pereira-Doel, P., Font, X., Wyles, K., & Pereira-Moliner, J. (2022). *Showering smartly in tourism accommodations*. SocArXiv Papers. <https://doi.org/10.31235/osf.io/dwba3>
- Rodell, M., Famiglietti, J. S., Wiese, D. N., Reager, J. T., Beaudoin, H. K., Landerer, F. W., & Lo, M.-H. (2018). Emerging trends in global freshwater availability. *Nature*, 557, 651-659. <https://doi.org/10.1038/s41586-018-0123-1>
- Statista. (2021). *Number of domestic travelers in Japan in 2020, by prefecture(in millions)*. <https://www.statista.com/statistics/1140184/japan-number-domestic-traveler-by-prefecture/>
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29(3), 309-317. <https://doi.org/10.1016/j.jenvp.2008.10.004>
- UNESCO, & UN-Water. (2020). *The United Nations World Water Development Report 2020: Water and Climate Change*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000372985.locale=en>
- Untaru, E.-N., Ispas, A., & Han, H. (2020). Exploring the synergy between customer home-based and hotel-based water consumption and conservation behaviors: An empirical approach. *Journal of Consumer Behaviour*,

- 19(6), 542-555. <https://doi.org/10.1002/cb.1826>
- UNWTO. (2018). *Tourism and the Sustainable Development Goals — Journey to 2030*. <https://www.e-unwto.org/doi/epdf/10.18111/9789284419401>
- Viglia, G., & Dolnicar, S. (2020). A review of experiments in tourism and hospitality. *Annals of Tourism Research*, 80, 102858. <https://doi.org/10.1016/j.annals.2020.102858>
- Warren, C., & Becken, S. (2017). Saving energy and water in tourist accommodation: A systematic literature review (1987-2015). *International Journal of Tourism Research*, 19(3), 289-303. <https://doi.org/10.1002/jtr.2112>
- Woodside, A. G., Hsu, S.-Y., & Marshall, R. (2011). General theory of cultures' consequences on international tourism behavior. *Journal of Business Research*, 64(8), 785-799. <https://doi.org/10.1016/j.jbusres.2010.10.008>
- WRI Aqueduct. (2019, January 20). *Optimistic scenario of Japan water risk in 2030* [Image]. Aqueduct Water Risk Atlas. <https://www.wri.org/aqueduct/>



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