

Integrating Behavioural and Institutional Approaches to Waste Management in Tourism Landscapes: A Conceptual Case Study of the Nilgiris District, India

Dr Srinidhi C¹, Dr Boobalan J², Kritika K Mahaur³, Kripa S⁴, S R Haritha⁵, Saanvi Tiwari⁶, Manasvi S⁷

¹Assistant Professor II, School of Economics, KCLAS, CBE, srinidhi.c.bco@kclas.ac.in

²Assistant Professor, Department of ECE, KCT, CBE, boobalan.j.ece@kct.ac.in

³Student, III Year, School of Economics, KCLAS, CBE, kritika.23beo@kclas.ac.in

⁴Student, II Year, School of Economics, KCLAS, CBE, kripa.24beo@kclas.ac.in

⁵Student, III Year, School of Economics, KCLAS, CBE, haritha.23beo@kclas.ac.in

⁶Student, III Year, School of Management, KCLAS, CBE, saanvi.23bba@kclas.ac.in

⁷Student, III Year, School of Management, KCLAS, CBE, manasvi.23bba@kclas.ac.in

Abstract

Mountain areas that are sensitive are especially at risk from trash left by tourists, mainly in popular spots with lots of visitors at certain times of the year and not enough people to make sure rules are followed. In the Nilgiris, trash from tourists moves around a lot and is hard to predict since it mostly comes from people visiting for a short time who do not feel responsible for keeping the place clean. This study suggests a way to manage trash that focuses less on strict rules and more on actions that encourage good behavior, involve the community, and use technology. Using ideas from how people make decisions, how people work together, and how technology can help, this plan has three parts that work together. First, simple changes are made to encourage people to throw trash away in the right way, like putting up colorful and interesting trash cans, using lights to guide people, and making the trash cans look appealing. These things grab people's attention and make it easy for them to do the right thing without forcing them. Second, the community is encouraged to take care of the area through programs led by young people that teach good behavior and respect between locals and visitors. This way, people see locals as examples of good behavior instead of just people who enforce rules. Third, tourists are encouraged to follow the rules through fun, game-like apps that make it rewarding to do the right thing. The study says that to take care of tourist areas that are sensitive, we need to change how we think about rules and instead encourage good behavior. By getting tourists to care about the environment through simple encouragements, community involvement, and technology, this plan offers a way to deal with trash in the Nilgiris district of Tamil Nadu that can be used in other places as well.

Keywords: *Behavioural Public Policy; Sustainable Tourism; Solid Waste Management; Mountain Ecosystems; Nudge Theory; Community Governance*

Introduction

Waste management is crucial to limiting carbon emissions, promoting sustainable practices, improving public health, protecting ecosystems, and preserving limited natural resources. To help encourage responsible waste behaviors and foster community participation, findings from multiple behavioral science disciplines (e.g., nudge theory) can offer some innovative strategies. This paper explores existing literature that connects nudge-based waste management promotions and identifies strategies that address both the behavioral and systemic challenges associated with improving the waste management system. Within the context of the Nilgiris, an area in which three dimensions of waste management, such as challenge, strategy, and nudge, interact in complex and frequently contradictory ways, an additional factor that creates waste management difficulties is the temporal and spatial distribution of waste generated from high volumes of tourists arriving at different times, creating distinct patterns of waste generation (i.e., composition, location, and temporal) when compared to the patterns of waste generated by people living in those same areas. Within the Nilgiris, there are multiple panchayats, municipalities, and contracted agencies responsible for implementing waste management interventions. However, the combination of high tourist traffic and relatively low levels of resources and staff working with institutions will create confusion regarding how to develop an effective and efficient waste management program, as opposed to continuing to operate within the confines of existing waste management systems developed in lowland environments and assuming those programs can perform effectively in a montane climate which is characterized by an eight-month monsoon, and where the operational challenges of implementing an effective waste management program will differ significantly from the challenges presented in lowland environments. It is necessary to develop a common objective because the research literature has typically separated out the study of tourism impacts from the issues of governance structures and environmental constraints in an analytical sense. For example, researchers studying waste management are primarily focused on technical processing of waste, conversely, researchers studying tourism are focused primarily on understanding consumer behaviour in regard to their travel activities, and researchers studying governance have tended to focus on the issue of institutional coordination between levels of governance. Unfortunately, most of the different frameworks examining tourism impacts, governance structures, and the environment have not attempted to develop an integrated framework that brings all three of these perspectives together. In the context of the Nilgiris region, where all of these dimensions play a critical role in driving optimum outcomes, developing an integrated framework is essential for developing appropriate policy that has relevance. The development of a conceptually rigorous and theoretically sound framework is the first necessary step in overcoming the current situation in which waste management practices for tourists are implemented as fragmented and reactive interventions by practitioners and policy-makers (e.g., neighbouring communities may implement awareness campaigns for tourists, whereas neighbouring communities may undertake enforcement strategies against tourists). The lack of a well-defined integrative conceptual framework limits the scalability, transferability, and sustained effectiveness of existing solutions for managing tourist waste. Governance of tourist landscapes presents challenges that are fundamentally different from the governance of residential or industrial land. The challenges posed by transient populations, weak place-based accountability, and spatial unpredictability make conventional regulatory tools ineffective for managing tourist waste. However, existing waste management frameworks, which were primarily developed for the governance of stable residential populations, offer limited insight into the operation of the waste management systems in these highly mobile land-use contexts. There exists a significant gap between the theoretical insights derived from behavioural economics, community governance, and digital policy literatures and the practical application of these theoretical insights in addressing tourist waste management issues. The objective of this paper is to provide an overview of the gap by synthesising disparate theoretical fields into a coherent policy framework.

Methodology : The study uses a conceptual, qualitative research design that is solely dependent on secondary data. To identify important institutional and behavioral drivers of waste and litter management, a systematic review of academic literature, policy documents, tourism guidelines, and waste management reports pertinent to international tourist destinations and the Nilgiris is conducted. The Nilgiris context is combined with comparative insights from tourist landscapes around the world to investigate waste generation patterns, governance responses, and management gaps. A cogent conceptual framework connecting tourism-related behavior and institutional mechanisms in waste and litter management is developed by integrating these insights through thematic analysis.

Theoretical Background: Nudge Theory: Nudge theory, formalized by behavioral economists Richard Thaler and Cass Sunstein in their seminal 2008 work *Nudge: Improving Decisions about Health, Wealth, and Happiness*, offers a framework for influencing human behavior without restricting choice or imposing mandates. A "nudge" is defined as any aspect of choice architecture that alters people's behavior in a predictable way without forbidding options or significantly changing economic incentives. Importantly, placing fruit at eye level in a cafeteria counts as a nudge; banning junk food does not. The theoretical foundation rests on insights from behavioral economics demonstrating that human decision-making systematically deviates from rational choice models. People rely on cognitive shortcuts (heuristics), are influenced by how choices are framed, exhibit present bias, and are sensitive to social norms and default options. Rather than viewing these tendencies as

failures of rationality, nudge theory treats them as predictable patterns that can be leveraged for socially beneficial outcomes.

Core Mechanisms of Nudge Theory: Several behavioral mechanisms underpin effective nudges. *Default bias* explains why people tend to stick with pre-selected options—whether organ donation enrollment or waste bin placement. *Salience* determines what captures attention in cluttered environments; brightly colored, strategically positioned bins outperform inconspicuous alternatives. *Social proof* leverages the human tendency to conform to perceived norms; messages like "90% of visitors dispose waste responsibly" normalize desired behavior more effectively than generic appeals. *Loss aversion*, the principle that losses loom larger than equivalent gains, makes warnings about environmental degradation more motivating than promises of future benefits.

Relevance to Waste Management in Tourist Contexts: In tourist landscapes, where populations are transient, enforcement is limited, and place-based accountability is weak, nudges offer distinct advantages over conventional regulation. Tourists make rapid, low-involvement decisions about waste disposal, often influenced by immediate environmental cues rather than long-term consequences or legal threats. Visual prompts, intuitive bin design, gamified engagement, and social norm messaging can redirect behavior at the moment of choice without requiring sustained attitude change or surveillance infrastructure.

However, critics argue that nudges may produce only modest, temporary effects and risk absolving policymakers of responsibility for structural reforms. Effective application therefore requires integrating nudges within broader governance frameworks that combine behavioral interventions with community engagement and regulatory enforcement—precisely the approach proposed for the Nilgiris context.

Research Objectives

- To conceptualize the interlinkages between tourism-driven waste generation, institutional responses, and climatic influences in the Nilgiris
- To propose an integrated conceptual framework for waste and litter management in tourist landscapes based on secondary sources.

Contextual and Operational Factors In Waste and Litter Management Practices: The unique climate and ecology of Nilgiris District create problems for managing solid waste effectively. With 36 administrative wards and over 4,200 commercial establishments, the 36 square kilometer district produces about 36 to 40 tons of waste every day, with the majority being wet waste. Waste management is mostly done by village/town panchayats and the municipality, but as most panchayats experience difficulty hiring manpower, an increasing number of waste management operations are being contracted out to private agencies. There are about 70 cleanliness workers (included in this number are permanent employee workers), who perform the duties of cleaning the main roads, bushes, drains, and storm water systems; public toilets; and collect garbage at the kerbside. All waste is collected by door-to-door garbage collection as has been implemented in the entire state. Another major problem is waste at the household level because there is not enough separation between wet and dry waste, which complicates the processing of both types of waste. The difficulty in processing waste in the area is exacerbated by the area's topography and by the fact that the area can get very large amounts of rain over an extended period (as long as eight months). This length of time delays the collection and processing of waste, and wet waste can take as long as 120 days to compost in Ooty's weather, whereas it would otherwise take about 30 to 45 days to compost on the plains, thereby decreasing the effectiveness of many micro composting centres currently in operation. Dry waste is separated into recyclable and non-recyclable dry waste. Some recyclable dry waste goes to scrap shops or cement plants. The tourist landscapes found throughout the Nilgiris district are characterized by the generation of transient solid waste and litter due to mobile short-stay visitors, who have little accountability for the places visited. Litter is typically generated along highways, where it is dropped either from moving or parked vehicles, and in ecologically sensitive locations like viewpoints, forest edges, and water bodies. This littering has had a negative impact on environmental quality and visitors' experiences while placing a disproportionate burden on already challenged local sanitation systems. This challenge transcends routine waste collection, revealing a behavior and operational gap that needs an integrated system design to include detection and citizen involvement, enforcement intelligence, and sanitation quick response operations. The main issue relates to the absence of an end-to-end systematic approach to preventing, reporting, acting upon and deterring litter created by tourists, without needing to deploy excessive personnel, continuous monitoring or intrusive monitoring. To accomplish this, the district requires to identify quickly littering incidents and high risk areas, provide a simple and credible means for citizens and visitors to report incidents, develop actionable workflows that will result in timely cleanups, enforce the rules when reasonable and develop feedback loops that will allow improved resource allocation and prevention planning. This system should be utilitarian in nature, non-adversarial, resistant to abuse, and comply with all legal and privacy requirements.

Policy Signals and Operational Trends from Press Reports: The Nilgiris district has been stepping up its game in waste management and cleanliness lately. People here are starting to realize just how serious the environmental challenges are, especially in a place as fragile as this. Over the past few years, a mix of grassroots action, tight administrative oversight, and even some legal moves have come together to tackle the stubborn problem of plastic and solid waste. The Micro Composting Centre (MMC) opened at Hubbathalai Panchayat. The District Collector cut the ribbon, and honestly, it's a pretty smart move for handling organic waste right where it's created. Instead of piling up in big landfills, local compost gets made and used - less pollution, more resource recovery. Not long after, the Udhagai Panchayat Union got people together for a huge cleanliness drive on January 12 and 13, 2026. Locals rolled up their sleeves and pitched in, making a real difference in keeping their neighborhoods clean. This kind of hands-on effort doesn't just make the place look better - it also gets people thinking about sorting their waste and tossing it out responsibly. Then, on February 22, 2025, the district organized a massive plastic waste collection event. Tons of plastic were gathered up, which just shows how big the problem is - but also how much folks care about fixing it. People learned more about how dangerous plastic is for the environment and for themselves. It was a big push toward building a stronger sense of responsibility for the place they call home. Still, the scale of the waste problem is hard to ignore. Just look at the 570 kilos of trash cleared from villages around Ooty. That's no small haul. It points to the real gaps in the local waste management system and the pressure on officials to keep up - especially as more tourists pour in and towns expand. Cleaning up takes a lot of manual effort and coordination, and honestly, it's a constant battle. Dig a bit deeper, and it gets even more complicated. Reports show Nilgiris is having a tough time getting rid of its "mountain of plastic." The reasons are pretty clear: not enough waste gets sorted, recycling options are limited, and single-use plastics keep flooding in. Fixing this mess calls for stronger policies and stricter enforcement, plain and simple. Things got serious enough that the Madras High Court stepped in, dragging major FMCG companies into court over the single-use plastic mess in Nilgiris and Kodaikanal. This is a big deal - it's about making companies own up to their part in the problem. The court's move highlights how important it is to hold the big players accountable and how the legal system can push for better environmental practices.

On the ground, municipal officials aren't letting up. The District Collector has been out inspecting waste management in places like Ottupattarai under the Coonoor Municipality, checking if things are working and making sure the rules are followed. These inspections matter - they help spot problems, tighten up operations, and bring in better ways to handle waste from start to finish. The government isn't stopping there. The Department of Rural Development and Panchayat Raj rolled out the Cleanliness Movement 2.0 across Nilgiris, proving they're in it for the long haul. This program brings together rural development and public health, pushing local bodies to upgrade their waste facilities and get more people involved. The District Collector's even making regular rounds in Ooty, keeping an eye on how the city handles its trash. These visits help track progress, fix what's not working, and keep everyone focused on getting better. And it's not just the towns, these efforts are reaching into the most sensitive ecological zones too, making sure the whole district is part of the push for a cleaner, healthier environment.

Recommendation Framework for Waste and Litter Management : Addressing solid waste and littering in the Nilgiris requires moving beyond infrastructure-centric solutions toward approaches that actively shape human behaviour within fragile tourist landscapes. Despite decentralised collection systems and regulatory frameworks, persistent littering - particularly by transient tourists' populations - reveals gaps in accountability, social norms, and everyday disposal practices. Drawing on behavioural economics, community participation, and targeted regulatory reinforcement, this section proposes an integrated solution

framework that complements existing solid waste management systems while remaining sensitive to the district's ecological, institutional, and cultural constraints. By combining non-coercive nudges, collective responsibility mechanisms, and incentive-compatible regulation, the interventions aim to normalise responsible disposal, strengthen stewardship, and reduce enforcement dependency.

Hence, the proposed solutions are categorised into three broad approaches:

1. **Behavioural interventions**
2. **Community engagement, and**
3. **Tourist-focused digital interventions.**

1. Behavioural Interventions through Nudge Theory in Waste and Litter Management: Behavioural change is central to addressing littering and improper waste disposal. Nudge Theory offers non-coercive tools to influence behaviour without restricting choice. In the Nilgiris, nudges such as default segregation systems, strategically placed bins, visual cues, social norm messaging, and feedback mechanisms can significantly improve compliance among residents, tourists, and commercial establishments.

1.1 Social Norm Nudges: Social norm nudges tap into something pretty basic: people like to fit in. Most of us end up copying what we think everyone else is doing, especially if it feels like that's just how things are done around here. In the Nilgiris district - where the environment is fragile and tourism brings in all sorts of visitors - these nudges can change how people deal with their waste. Say you put up a sign that reads, "85 percentage of households in this village segregate waste daily." That number sticks. It gives people the sense that separating waste isn't just a good idea - it's the village norm. Suddenly, not joining in feels out of step. Recognizing zero-waste streets, local markets, or tourist spots takes this further. When you call out the folks doing things right, you make responsible waste management something to be proud of. Scoreboards showing how neighborhoods are doing with segregation and cleanliness keep everyone honest and turn waste management into a team effort, not just an individual chore.

1.2 Default Option Nudges: Defaults matter more than most people realize. If you set something up as the standard choice, most folks just go with it. It's easier, it feels normal, and you don't have to think twice. In the Nilgiris, when you make waste segregation the default - like installing separate bins for biodegradable, recyclable, and non-recyclable waste everywhere tourists and locals go, good habits start to spread. You're not asking people to make a special effort; you're just setting things up so the right choice is the easiest one. There's less need for rules or policing. Everyone falls into environmentally responsible behaviour almost by accident, just because that's how things work around here.

1.3 Salience and Visual Cue Nudges: Sometimes, the trick is just making the right choice impossible to miss. That's where salience and visual cues come in. If you're in a place full of visitors from all over different languages, different backgrounds - clear, eye-catching signs work wonders. Think color-coded bins with big, obvious icons. No confusion, no hesitation. Footpath arrows that point straight to the nearest bin? Suddenly, it's way easier to toss your trash where it belongs instead of dropping it on the ground. And if those bins are decorated with local art, tribal patterns, wildlife designs, they stand out even more. People notice them, maybe even enjoy using them, and the bins themselves say something about the community's values. It's a small thing, but it gets people to care just a little bit more about keeping the Nilgiris clean.

1.4 Loss Aversion Nudges: People hate losing what they already have. That's loss aversion in a nutshell, and it's a powerful way to get folks thinking differently about waste. Instead of only talking up the benefits of good waste management, point out what the community stands to lose if things go wrong. Remind people that "Plastic waste today means polluted streams tomorrow." Show them the damage, photos of litter clogging rivers or piling up in forests. Bring in the real-life costs: how much money the local Panchayats have to spend just to clean up after tourists. When you frame waste as a threat to the local environment or the community's wallet, people pay attention. It stings a little, but that's exactly what pushes people to protect what matters.

1.5 Magic Bin Initiative: Nudge-Based Waste Disposal in Tourist Landscapes: The *Magic Bin Initiative* applies principles of behavioural economics and environmental psychology to reframe waste bins as interactive, culturally embedded interventions. Rather than functioning as passive infrastructure, these bins operate as nudging devices that promote pro-environmental behaviour through visibility, aesthetics, social signalling, and spatial alignment within tourist landscapes.

Application Area 1: Visual and Cultural Design Interventions

Waste bins are designed as visually distinctive, culturally resonant landmarks inspired by Nilgiri heritage, indigenous motifs, and local wildlife. These 'Instagrammable' designs leverage social proof and positive reinforcement, making responsible waste disposal socially desirable and emotionally engaging.

Application Area 2: Strategic Spatial Placement and Visitor Engagement - Magic Bins are strategically located at high-footfall zones and photo hotspots at intervals of approximately 100–150 metres. Interactive features such as QR-based storytelling, humour cues, or behavioural prompts are integrated to capture visitor attention and align waste disposal with natural tourist movement patterns.

Application Area 3: Glow-Pathway Nudges for Wayfinding and Litter Reduction -Low-energy illuminated pathways and visual trails guide tourists from high-litter-generation zones (food stalls, viewpoints, parking areas) toward the nearest disposal points. This intervention reduces cognitive load, removes navigation-based excuses, and subtly directs behaviour without enforcement.

Together, these applications transform waste disposal into a socially visible, emotionally positive, and spatially effortless behaviour, aligning individual tourist actions with broader goals of environmental sustainability and destination cleanliness.

2. Community Engagement and Collective Responsibility

Community participation should be institutionalised through local committees, self-help groups, youth organisations, and indigenous community structures. Peer monitoring, recognition of best-performing communities, and participatory decision-making can foster long-term behavioural change and ownership of waste management practices.

2.1 Pop-Up 'Clean Carnival Zones': Festive Social Nudges for Waste Reduction

This initiative applies temporary, event-based nudges to convert waste management from a rule-bound activity into a collective, enjoyable social norm within high-footfall tourist landscapes of the Nilgiris. Temporary 'Clean Carnival Zones' are set up during peak tourist seasons at crowded locations such as viewpoints, promenades, and market areas. These zones combine festive design, participatory games, and zero-waste practices to actively engage tourists and local visitors in proper waste disposal, including :

- Litter-hunt games for families and children
- Stamp or passport rewards for using bins correctly
- Live composting or recycling demonstrations operated by local youth groups

All vendors operating within the zone follow strict zero-waste guidelines, using biodegradable plates and cups to reinforce credibility.

2.2 Postcard-to-Yourself from the Hills: Commitment-Based Memory Nudges: This initiative leverages commitment and memory cues to extend environmentally responsible behaviour beyond the tourist visit, linking the Nilgiris experience to future actions. Tourists are invited to write a postcard to themselves at kiosks located at scenic viewpoints and transit hubs. The postcard captures a personal pledge related to waste reduction or responsible travel behaviour. These postcards are mailed back to the tourist 2-4 weeks after their visit, serving as a delayed behavioural reminder.

Key design elements include:

- Use of recycled or seed paper
- Optional QR codes linking to digital reflection or feedback forms
- Facilitation by trained local youth volunteers

Policy and Practice Linkage: These interventions align closely with India's Swachh Bharat Mission (SBM) and emerging behaviourally informed public policy approaches, without relying on enforcement or penalties. They are especially suitable for fragile hill ecosystems where conventional surveillance-based waste management is difficult.

2.3 Academic Integration and Student Mobilisation: Formal partnerships are established between district authorities and local colleges to engage students as part of structured academic programmes. Students participate as interns or volunteers in awareness campaigns, basic environmental monitoring, and peer-to-peer communication in tourist-heavy locations.

Activities include:

- Student-led awareness drives at viewpoints and markets
- Simple mobile-based mapping of litter-prone areas
- Informal engagement with tourists using digital tools and social media- Undergraduate students from colleges in Ooty and Coonoor conduct weekend outreach at Botanical Garden entrances, bus stands, and lakefront areas as part of environmental studies or social work courses.

2.4 Women-Led Circular Economy and MLP Management: Local women's self-help groups (SHGs) are integrated into plastic waste management, with focused training in the handling of multi-layer plastic (MLP) commonly generated by tourists. Women manage collection points, basic segregation, and coordination with recyclers.

- MLP collection and sorting at tourist nodes
- Small-scale processing or baling at ward-level centres
- Community outreach promoting waste reduction

2.5 Logistic Ambassadors: Transport-Based Waste Nudges: Cab and taxi drivers are trained as Eco-Ambassadors, using their daily interaction with tourists to communicate basic waste norms. Vehicles are equipped with simple waste collection bags to prevent littering during travel.

- Short verbal briefing on plastic-free rules at trip start
- In-car temporary waste storage
- Recognition for compliant drivers.

3. Tourist-Focused Digital interventions.

Given the high seasonal influx of tourists, targeted strategies are essential. Deposit–refund systems for plastic packaging, mandatory waste management protocols for tourism establishments, and behaviourally informed messaging at entry points can reduce litter generation in ecologically sensitive tourist zones.

3.1 Interactive Web Portals: "Voice of the Wild" Experience: The official Nilgiris tourism website is conceptualized as an interactive and narrative-driven platform where wildlife mascots are used as virtual tour guides. These mascots share brief, emotionally appealing narratives that relate tourist actions with environmental consequences, especially with respect to litter and plastic pollution in the environment.

Key features:

- Storytelling by the mascots with respect to the impact of litter and plastic pollution in the environment
- Interactive changes in the visual design of the website based on the actions of the visitor (e.g., littered or clean environment)
- Interactive pledges placed at the beginning of the website for accessing travel information

3.2 Social Media Amplification: The #NilgiriStories Campaign: A coordinated social media campaign using influencers, local youth groups, and tourists can promote the idea of responsible tourism as socially desirable. The promoted content can include real-life images of waste management practices rather than the general aesthetic appeal of the locations.

Some of the activities that can be part of the campaign are:

- Engagement of influencers in activities like collecting or segregating the waste
- Short videos showing the work done by the youth groups and the people involved in the management of the waste
- Promotion of the activities using the hashtag created for the campaign

Conclusion

The issue of tourism-related wastes and litter in the Nilgiris is an issue of governance that cannot be tackled with an expansionist and enforcement-based approach. The present study clearly illustrates that sustainable management of wastes and other ecological issues in ecologically sensitive tourist spaces requires an integrated approach to behavioral interventions and tourist-centric digital regulations. The proposed framework would transform the entire paradigm of waste management from an enforcement-based approach to behavioral intelligence and collective responsibility. Perhaps most importantly, this proposed framework would understand the difference between governing tourist populations and governing permanent residents. The short-stay tourist population with low levels of place-based accountability is more likely to respond to emotionally engaging experiences and social experiences than to delayed penalties and surveillance. Therefore, the success of this proposed framework would depend upon long-term coordination among the district administration, the local population, tourism stakeholders, and technology partners. By recognizing the issue of tourism-related wastes and litter as more of a behavioral and social issue than merely a technical issue, the Nilgiris would be able to transition from an enforcement-based regulatory paradigm to 'behaviorally intelligent regulations.'

References

- Anjos, F. A., & Kennell, J. (2019). Tourism, governance and sustainable development. *Sustainability*, 11(16), 4257. <https://doi.org/10.3390/su11164257>
- Bramwell, B., & Lane, B. (2012). *Tourism governance: Critical perspectives on governance and sustainability*. Routledge.
- Dolnicar, S. (2020). Designing for more environmentally friendly tourism. *Annals of Tourism Research*, 84, 102933.
- Farrow, K., Grolleau, G., & Ibanez, L. (2017). Social norms and pro-environmental behavior: A review of the evidence. *Ecological Economics*, 140, 1–13.
- Hall, C. M. (2011). A typology of governance and its implications for tourism policy analysis. *Journal of Sustainable Tourism*, 19(4–5), 437–457. <https://doi.org/10.1080/09669582.2011.570346>
- Ni, X., Wang, D., Chang, J., & Li, H. (2024). Digital nudging for sustainable tourist behavior in new media. *Tourism Management*, 105, 105087.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.
- Reisch, L. A., & Sunstein, C. R. (2016). Do Europeans like nudges? *Judgment and Decision Making*, 11(4), 310–325.
- Souza-Neto, V., Marques, O., Mayer, V., & Lohmann, G. (2022). Lowering the harm of tourist activities: A systematic literature review on nudges in tourism sustainability.
- Sunstein, C. R. (2014). Automatically green: Behavioral economics and environmental protection. *Harvard Environmental Law Review*, 38, 127–158.
- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. Yale University Press.
- UNDP. (2019). *Leveraging behavioural nudges to improve waste collection at the Gorkhi-Terelj National Park*. United Nations Development Programme.
- Venkatachalam, L. (2008). Behavioral economics for environmental policy. *Ecological Economics*, 67(4), 640–645.
- Wang, L., et al. (2024). A network perspective on tourism waste management: Stakeholder participation and cooperation. *Journal of Cleaner Production*, 445, 141378.
- Zhang, Y., et al. (2025). Contextual behavioral informed nudges to stimulate waste prevention and recycling. *Ecological Economics*, 233, 108576.