



Tourism and cultural commons in the Ecuadorian Amazon

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ABSTRACT

Tourism is among the largest global market forces driving both environmental and sociocultural change, and indigenous peoples residing in biodiverse regions are particularly vulnerable to this change. As indigenous people engage with global markets, questions arise regarding how different forms of tourism privilege particular indigenous knowledge, and how local communities proactively leverage their knowledge to improve the social and environmental outcomes of tourism. The aim of this ethnographic case study in the region around Misahuallí, Ecuador is to provide a thick description of the tourism-related social, cultural, and environmental changes being faced by this indigenous community, itself a microcosm of the challenges being faced by indigenous communities across the globe. Common pool resource theory and the concepts of *subtractability* and *non-excludability* are invoked to analyze the ways that tourism influences the management of traditional cultural knowledge, and alternatively, how this knowledge influences the ways that tourism manifests in the local community. This novel application of traditional ecological knowledge and common pool resource theory to tourism research provides a critical link between these theories, and it extends existing analyses of tourism's influence on common pool environmental resources to common pool cultural resources, in this case, traditional knowledge in Kichwa communities.

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Introduction

With over 1.4 billion travelers crossing international borders each year (UNWTO, 2018), tourism is key driver of social, cultural, and environmental change and transformation (Marcinek & Hunt, 2015, 2019; Christen, 2005; Smith, 1977; Stronza, 2001). These processes of change are particularly pronounced in indigenous communities, whose presence co-occurs in Earth's most biodiverse landscapes (Gorenflo, Romaine, Mittermeier, & Walker-Painemilla, 2012). Traditional activities, cultural practices, and livelihoods of indigenous communities often become sidelined as new economic opportunities emerge from the global stage. Environmentally intensive industries such as oil drilling, logging, large-scale fishing, and mono-cropping, have a particularly pronounced influence on indigenous

communities (Sawyer, 2004), though the development of tourism in regions largely inhabited by indigenous people can also be socially, culturally, and environmentally disruptive to traditional ways of living (Coria & Calfucura, 2012; Johnston, 2006; Zeppel, 2006). The entrance of these new economic activities can lead not only to damage to biodiverse natural resources upon which indigenous and rural communities rely, but also to loss of traditional activities, livelihoods, and place-based knowledge (Berkes, Colding, & Folke, 2000; Smith, 2014). Understanding the ways that tourism influences cultural resources, and the ways that they are protected or exploited, remains central to improving outcomes of tourism in general and for indigenous communities specifically.

One of the most prominent influences on our scholarly understanding of how resources are exploited and protected comes from common pool resource theory. Stemming from Hardin's (1968) influential 'tragedy of commons' example of dwindling environmental resources, common pool resource theory not only accounts for how the processes leading to the loss of important resources unfold, but it also accounts for the ways that collective action can overcome the tragedy and protect important resources. Although the tradition of applying this theory to environmental and natural resources remains strong, increasingly this theory is being applied to cultural resources as well. Despite broad application of common pool resource theory across numerous disciplines, it has rarely been invoked in analyses of tourism. Given the ongoing global loss of cultural diversity and traditional knowledge (Berkes et al., 2000; Gorenflo et al., 2012), a great opportunity thus exists to incorporate this theory into analyses of tourism's impacts on not just the environment and natural resources, but on cultural resources. Such research will improve our understanding and help inform tourism practices that are less likely to contribute to the loss of threatened indigenous cultural heritage.

In the Napo Province of the Ecuadorian Amazon, over half (56.8%) of the 100,000 residents self-identify as *indígena* (INEC, 2017). Typical livelihood strategies in this region include wage labor for petroleum companies, cash cropping, handicraft sales, cattle, timber, hunting, and fishing (Lu & Bilsborrow, 2011). While tourism is currently a minor economic development activity for the region, the percentage of indigenous, non-indigenous native, and foreign individuals working in tourism has grown in recent years (Doughty, Lu, & Sorensen, 2010), partly because some types of tourism might reconcile competing agendas of global market development, ecological conservation, and cultural survival (Davidov, 2013). The region thus serves as a microcosm in which to analyze the challenges and opportunities that tourism creates for indigenous communities across the planet who are experiencing the loss of traditional practices and ways of knowing.

This ethnographic case study analyzes empirical data research gathered over multiple field seasons in a rural Indigenous community in the Amazonian Ecuador. The resulting empirical data provide insights into how tourism influences, and is influenced by, cultural resources in Kichwa communities where tourism has recently be developing. A focus here is on a particular cultural resource – indigenous knowledge – and the ways that it reflects the qualities of subtractability and non-excludability that characterize common pool resources (Gardner, Ostrom, & Walker, 1990). Through identifying these qualities, we are then able to demonstrate how common pool resource theory helps explain how tourism is impacting, and in some cases transforming, traditional indigenous knowledge in this part of Ecuador. In assessing the ways that indigenous residents in the Amazonian rainforests engage with the global tourism market, this paper provides a needed

contribution linking theories related to traditional knowledge, common pool resource theory, and the analysis of tourism.

Literature review

Culture & traditional knowledge

The scholarship outlining tourism's influence on culture dates to some of the earliest tourism-specific scholarly writings (e.g. deKadt, 1979; Smith, 1953, 1977), as well as the first academic meeting on tourism organized geographer turned anthropologist Valene Smith (Leite & Graburn, 2009). While a full review of that scholarship is beyond the scope of this paper (see Leite & Graburn, 2009 for one comprehensive account), here we focus our theoretical review on writings that address a particular type of cultural resource – traditional knowledge. As Berkes, Colding, and Folke note, 'Traditional knowledge, as a way of knowing, is similar to Western Science in that it is based on an accumulation of observations' (2000, p. 1251). Traditional ecological knowledge (TEK) is the category of indigenous knowledge that has received the most scholarly attention, particularly in numerous influential writings by Fikret Berkes (including, but far from limited to, Berkes, 1989, 2018; Berkes et al., 2000). TEK comprises the bodies of knowledge, beliefs, traditions, practices, institutions, and worldviews developed by indigenous and local communities that offer alternative perspectives, often to those of western scientific knowledge, based on locally developed practices of resource use (Berkes et al., 2000). TEK is linked to the improved indigenous community resilience to global environmental changes, including lower rates of deforestation than in state-managed protected areas (e.g. Gómez-Baggethun, Corbera, & Reyes-García, 2013).

Perception of TEK among the literature has shifted from it being considered a static resource to recognition that TEK is dynamic in nature and subject to adaptation and transformation through changing global ecological and socioeconomic conditions. As noted by Berkes et al. (2000), interest in the ways that traditional knowledge informs the conservation of endangered species, management of protected areas, and other sustainable resources has long existed. Despite the importance of traditional knowledge for ensuring sustainable resource management, it has rarely been explored in the context of tourism. The ways that traditional knowledge is both lost and perpetuated in the context of tourism is likely to generate insights into how tourism can be planned and managed more sustainably for indigenous communities.

Where TEK has often been explored is in the context of rural Amazonian communities. Becker and Ghimire (2003) demonstrate that cooperation between TEK and western knowledge among the rural farming community of Loma Alta resulted in curtailed destruction of a forest commons. Villagers leveraged the support of conservation NGOs to establish the first community-owned forest reserve in western Ecuador through shifting their existing kin-based communal tenure system historically managing the local watershed. Traditional knowledge was also explored in the context of intellectual property rights for Shamans among the Shuar of the Ecuadorian Amazon (Nagan, Mordujovich, Otvos, & Taylor, 2010). This research demonstrated that traditional shamanic knowledge is secretive, sensitive, and highly valued among trainees of this profession. They therefore call for legal protection of this cultural resource from misappropriation through acts of 'biopiracy' (Nagan et al., 2010).

Outside of the Amazon, digital cataloguing of Aboriginal traditional knowledge in Australia reveals the complicated relationship between new technologies and traditional bodies of knowledge. Questions of ‘what constitutes?’ and ‘who owns?’ traditional cultural knowledge are explored as the seemingly contradictory integration of digital technologies into culture-based market ventures has taken place (Christen, 2005, p. 318). In this context, interactions occurring between traditional knowledge and globalizing markets via the use of technology is ‘negotiated within a dynamic set of cultural protocols that continually tack back and forth between innovation and preservation.’ Technology and markets among traditional cultural systems are not posed as an inherently disruptive invasion, but instead these elements of globalization provide space for compromise, negotiation, integration, and collaboration when they enter into traditional cultural systems (Christen, 2005). Tourism is another hallmark element of globalization (Mowforth & Munt, 2015), the ways that TEK and cultural systems are renegotiated and integrated into tourism systems remains underrepresented in the tourism literature.

Traditional knowledge and common pool resource theory

TEK has often been invoked to provide examples of ways that Hardin’s (1968) tragedy of the commons can be overcome with collective management of common pool resources (Agrawal, 2001, 2014; Berkes, 1989). According to Ostrom (2002, 2008, pp. 10–11), common pool resources:

... refer to systems, such as knowledge and the digital world, in which it is difficult to limit access, but one person’s use does not subtract a finite quantity from another’s use. In contrast, common-pool resources are sufficiently large that it is difficult, but not impossible, to define recognized users and exclude other users altogether. Further, each person’s use of such resources subtracts benefits that others might enjoy. Fisheries and forests are two common-pool resources that are of great concern in this era of major ecological challenges. Others include irrigation systems, groundwater basins, pastures and grazing systems, lakes, oceans, and the Earth’s atmosphere.

Hardin’s illustration of rational users acting among a finite resource laid the groundwork for countless iterations of his original theory regarding unrestricted use of common pool resources, including the influential work of Nobel Prize winner Ostrom (e.g. Ostrom, 1990; Ostrom, Chang, Pennington, & Tarko, 2012). Present in the above definition are two characteristics of common pool resources that are consistently present across the vast writing on this topic. First, common pool resources are *subtractable*. That is, use of the resource by one user reduces the resource’s availability to other potential users. Common pool resources provide a flow of resource units over time, and a unit that is withdrawn by one user is not fully available to another user, often leading to rivalry (Gardner et al., 1990). Secondly, common pool resources are *non-excludable*, meaning restricting access to them is difficult. It is costly to exclude potential users, through institutional or physical means, from accessing and using the resource. Common pool resources will exhibit these elements of subtractability and non-excludability, and therefore any sound analysis of a common pool resource will seek evidence of them.

While common pool resource theory has rarely been applied to tourism, what scholarship does exist has focused on management and governance issues leading to the sustainable use of environmental common pool resources (Briassoulis, 2002; Heenehan et al.,

2015). Focusing her study on tourism as a livelihood for indigenous community residents, Stronza (2010) provides a particularly insightful description of the ways that ecotourism has increased the capacity of indigenous communities to sustainably manage common pool resources in the Peruvian Amazon, including both environmental (tangible) and cultural (intangible) resources. Healy (1994) conducted a study focused entirely on the tourist experience as a common pool resource. The opportunity thus remains to apply highly influential common pool resource theory, and the central characteristics of subtractability and non-excludability, to the governance of cultural resources and traditional knowledge in the context of tourism.

Research questions

Drawing upon the literature reviewed above, this analysis will assess the role of local traditional knowledge within the tourism market in the rainforest community of Misahuallí, Ecuador. As we'll show, traditional knowledge exhibits the characteristics of a common pool resource, and we outline evidence of existing formal and informal institutions governing these local knowledge resources for their use in tourism. The institutions most associated with tourism will be assessed in terms of their effectiveness for sustainable governance or management of cultural resources and traditional knowledge. The following over-arching research questions guide this analysis:

1. How do the qualities of *subtractability* and *non-excludability* manifest in cultural resources and traditional knowledge in the Misahuallí tourism market?
2. In what ways are the existing management and governance regimes of the knowledge commons in Misahuallí influenced, both positively and negatively by the growing presence of tourism in this community?

Study methods

Study site

Puerto Misahuallí (hereafter simply Misahuallí) sits at the intersection of the Misahuallí and Napo Rivers, in the Napo Province of Ecuador (Figure 1). The population of Misahuallí is primarily self-identified indigenous peoples, non-indigenous Ecuadorian natives, and a smaller expatriate population of Americans and Europeans. As noted elsewhere (Marcinek & Hunt 2015; Davidov, 2013), the Napo region in general and Misahuallí in particular are undergoing intensive social, cultural, and environmental change related to the presence of extractive oil and timber companies as well as a burgeoning nature-based tourism industry. This location thus serves as a microcosm for the issues faced by indigenous and rural ethnic communities across the globe.

With respect to tourism in this community, a paved road from the nearby town of Tena leads national and international tourists to this jungle outpost for adventure and eco-cultural tourism activities. There are seven main operators in Misahuallí that offer comparable tourist packages. Tours typically range in length from one to five days, offering sightseeing throughout riverside communities, rainforest hikes, tubing and kayaking, and camping in rustic cabins. Several indigenous community tourism projects line the riverbanks to the east of Misahuallí. These projects also offer cultural demonstrations, traditional dance,

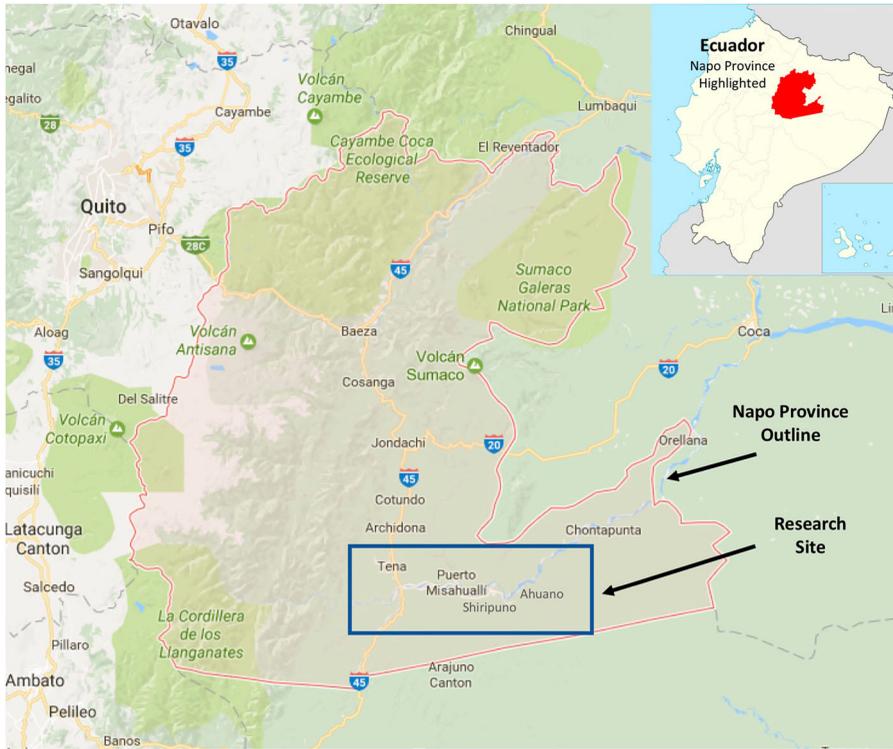


Figure 1. The study region.

lance throwing, cooking, and interpretation of indigenous knowledge of rainforest ecology. Most tours require travel via motorized canoes departing daily from Misahuallí.

Design & data collection

Although substantial research has been conducted on common pool resources, there is limited existing research treating traditional knowledge as a common pool resource. Therefore, an exploratory case study was undertaken employing ethnographic methods (Bernard, 2011). Ethnographic methods are a suite of data gathering techniques, the hallmark of which is the use of participant observation with the objective of capturing emic understandings of phenomenon, that is, the point of view of those being studied (Harris, 1976), and generating a ‘thick description’ (Geertz, 1973) and analytical account of the outcomes of tourism for indigenous knowledge. Immersion in the daily lives of a cultural group’s members, engaging in participant observations, and conducting interviews enable the ethnographer to derive her own (etic) conclusions as well as to report the informants’ own (emic) views of the cultural group (Bernard, 2011; Harris, 1976).

Data were gathered by the first author during ethnographic research undertaken in and around Misahuallí, Ecuador. The second author first visited this region in 2003, and second author first visited in 2013. The work presented here is based primarily upon the suite of ethnographic data gathered by the first author during two seasons of fieldwork in the Misahuallí region in May–June of 2013 and May–July 2016. Both researchers were involved in

the conceptualization and design of this research, as well as the analysis of the resulting ethnographic data.

The hallmark ethnographic technique of participant observation occurred throughout the project, and consisted largely of engagement in tourism activities, boat trips to tourism projects, tours of lodge premises, meals with lodge owners and employees, and informal interactions with visitors to tourism projects. Frequent travel occurred to provincial capital Tena provided interaction with regional Ministry of Tourism officials. Captured via jotted field notes, these informal conversations providing additional insights into general characteristics and daily life in for the residents of Misahuallí. Active participant observation carried out in tourism activities offered by local operators was likewise consistently captured in jot notes that were subsequently elaborated into more complete field note entries recorded on a laptop computer at the end of each day. This original data was supplemented by archival investigations incorporate web sources from local tourism agencies, tourism locations, and the Ecuadorian Ministry of Tourism in both Tena and at the national level. A daily log of fieldwork tasks accomplished and those yet to occur was systematically maintained throughout the fieldwork (Bernard, 2011; Musante & Dewalt, 2011).

Additional ethnographic data were gathered through semi-structured key informant interviews and archival research. Elements of this broader work have been prepared elsewhere (Marcinek & Hunt, 2015, 2019), and the unique analysis provided here is based primarily data gathered in 18 semi-structured interviews, though we frequently invoke broader ethnographic understandings to inform our interpretations and insights presented below. These interviews took place with culturally specialized informants (Bernard, 2011), a purposive sample of individuals with cultural expertise in the local tourism industry in and around Misahuallí. Employees or managers in the ecotourism industry were initially recruited in order to better understand the daily functioning and structure of various projects and agencies. Where possible, these individuals were contacted prior to arrival in the field sites via the Internet presence of their businesses.

As the fieldwork progressed, these initial informants serve as seeds for further chain referral sampling of tourism project owners, local agency representatives, and government officials (Bernard, 2011). This sampling strategy resulted in interviews with, among others, the Environmental Engineer for the Ecuadorian Ministry of Tourism in Tena and the current mayor of Misahuallí, individuals of high level of cultural competence in tourism-related issues in the region.

Across the pool of the 18 key informants recruited for the semi-structured interviews, twelve individuals self-identified as indigenous, four were local non-indigenous Ecuadorian natives, and two informants were *expatriate* lodge owners hailing from outside of Ecuador. One expat interview was conducted in English, while all other interviews were conducted in Spanish by the first author. Interviews took place in distinct locations that included the homes, office, and lodges of the interviewees. Audio recordings of interviews were captured on a field recorder with prior consent. The researcher took detailed notes to supplement recorded conversations, including observations of the physical environment, informant appearance or actions, and timestamps (Emerson, Fretz, & Shaw, 2011).

Across all informants, semi-structured interviews were conducted in a manner consistent with Spradley (2016). Principle themes explored in these interviews included (a) leadership and entrepreneurship in tourism; (b) representation of indigenous culture in tourism; (c) day-to-day operations of lodges and tour agencies; (d) general characteristics of typical

forms of tourism in and around Misahuallí; (e) the degree of local vs. foreign ownership and management of tourism projects. In the process of pursuing these themes, informants with higher degree of tourism-specific knowledge were able to elaborate extensively on themes of tourism policy, forms of tourism advertisement, local tourism-related institutions, notable successes and failures of tourism in the region, funding of regional development projects, local and national policies for tourism development, and future directions for tourism in the region. Additionally, themes such as guide licensing, knowledge of local flora and fauna, oil extraction in the region, and local entrepreneurial savvy often arose in the interviews, as they are inherent to the Misahuallí tourism market.

Semi-structured interview data were further triangulated *in situ* with participant observation data, archival data, and data culled from numerous informal conversations and interviews. Semi-structured and informal interview recordings were transcribed by the authors and imported into MAXQDA, a software package that enables advanced coding, retrieval, and analysis of qualitative data. Structural indexing of data on this level allowed for initial organization of all data sources and facilitated querying of the overall dataset during qualitative analysis (Saldaña, 2015). A second cycle of thematic coding identified emergent themes among the Misahuallí tourism market based on repetitions in responses, local resident categorization of phenomenon, use of metaphors and analogies to convey local perspectives, and theory-related materials (Bernard, Wutich, & Ryan, 2016). Categorization of responses to interview questions was useful for revealing patterns evocative of common pool resource theory, including notions of subtractability and non-excludability.

Within the common pool resource framework, codes for indigenous knowledge and traditional ecological knowledge were separated out to identify cultural, ecological, or regionally specific indigenous knowledge directly expressed by indigenous informants and employed by non-native or expat informants in the context of tourism. Throughout the coding process, memos recorded reactions, questions, analytical ideas, and inter-connections among elements of the overall corpus of qualitative text. This overall ethnographic approach provided a strong inductive basis for exploring the emic perspective of local residents as to tourism's impact on local culture and knowledge. The analysis of this broad corpus of ethnographic evidence yielded the analysis appears in remainder of the paper.

Findings related to the influence of tourism on traditional knowledge commons

Subtractability of traditional knowledge

Indigenous, native, and foreign expatriate residents all engage in the local tourism market in Misahuallí. An element of subtractability among the knowledge commons in the Misahuallí becomes apparent when foreign service providers and foreign tourists enter the milieu. As noted by Christen (2005) there is space for integration and collaboration when globalizing markets enter into traditional cultural systems. International tourists by their nature bring a different set of knowledge to tourism experiences in Misahuallí, as Lonnie (pseudonyms used throughout), an agency manager and owner in business with his brother and sister notes:

Foreigners bring in foreigners. Like if you were sitting here [in the office] and a group of Americans walked by, they would come in here. They would be saying 'oh, look. She looks American. Let's go here.' Also, foreigners have more capital.

Lonnie here points out that foreigners are attracted to foreign service providers, and that foreigners tend to have more money to spend when they visit Misahuallí. Foreign tourists attending one tourism provider will not attend others, which means that any knowledge or capital they might have transferred to another local provider is subtracted. Similarly, an American-Chilean expat who owns a project down the river explained:

98% of our guests are foreigners. They are from Europe, North America. That 2% is people that are *pelucones*. It's what they call the rich people ... artists, writers, Ecuadorians that are into the environment. The idea is that our guests are people who don't pay tour providers. They know they are paying at least 40% more. Our guests are people that travel with book in hand.

This foreign lodge owner expresses the intention to attract mostly foreign tourists. In fact, this expat points out that his tourists might actively *avoid* patronizing local tour operators in Misahuallí. Thus as external actors arrive to capture the revenues generated by international visitation, an opportunity for local indigenous residents to engage in the transmission of their own traditional knowledge is subtracted, displaced by new sets of knowledge brought into Misahuallí by these foreigners. Such processes limit the overall pool of tourism opportunities for local Kichwa residents to provide their own, first-hand interpretations of traditional knowledge.

Likewise, the opportunity for indigenous and non-indigenous native service providers to grow and innovate their *own* knowledge once the tourism market emerges is available to few residents. Within this market, interactions with international tourists frequently contribute to transformations of local knowledge (Christen, 2005). One observed transformation stems from foreign language development. Mateo is one of seven employees, all Kichwa, working for the American-Chilean expat upriver from Misahuallí. His primary job is to take visitors to the lodge on jungle treks and lead cultural and environmental interpretation exercises. According to Mateo:

I have never learned from a book, for example, with how to lead groups of people and be a guide. I was never contracted with other agencies. I simply asked my father questions so that I learned directly what each plant was used for. I would take the plant, show him, and ask him. This is how I gained this knowledge, directly.

Mateo has honed his guiding skills and ability to communicate traditional ecological knowledge related to native species of the Amazon, passed along from his father's vast knowledge of local flora and fauna.

Yet Mateo explained another impetus for becoming a guide, which may have been an opportunity presented to him, and in the process, subtracted from other guides in the area who do not have either an English-speaking boss or a reliable stream of English-speaking tourists to work with:

Around here many people know our native language of Kichwa, and secondly Spanish ... for me, the idea to become a guide is because I am curious about answering the questions that people have in other languages like English ... so I've worked to learn other languages.

The ability to communicate with guests in their native languages is a lucrative skill in the tourism industry, and also a positive personal outcome for this individual guide. Mateo and

the other six Kichwa employees at this lodge likely have more opportunities to transform, expand, and transfer their set of local knowledge through interactions with international (or politically influential national) visitors (Godoy, Reyes-García, Byron, Leonard, & Vadez, 2005). Language skills thus allow certain individuals to exploit their shared cultural knowledge in the context of tourism, and in the process, subtract such opportunities to earn income and perpetuate that knowledge through tourism from other local residents who lack such language skills.

Opportunities for interaction with foreign guests are also subtracted from other guides and service providers in the area. Exposure to foreign languages and lifestyles through tourism harkens back to Christen's (2005) exploration of collaborations among traditional knowledge and new markets and technologies. Foreign languages and worldviews among traditional cultural systems are not an inherently disruptive 'invasion,' but instead, provide a space for compromise, negotiation, integration, and collaboration. When expats or those with language skills are better able to engage with comparatively wealthy visitors, an economic value of the cultural resources is subtracted from other local users of the traditional knowledge, namely indigenous residents themselves.

Not surprisingly, rivalry often exists among users of a subtractable resource (Gardner et al., 1990). Evidence of rivalry related to use or communication of the local traditional knowledge commons appeared when one tourism business owner chose not to patronize a certain local project because of the ways in which traditional knowledge is projected through their services. Raul, a former freelance guide, sees value in explanations to his visitors that combine scientific and ancestral knowledge. When asked about how other projects in the area incorporate these two different knowledge systems, he explained:

Truths exist here, for example that a shaman can enter into the body of someone and make something happen. This is magic. To say if this really works or not is something entirely different, but we still explain that there is magic involved ... it is necessary to know these local beliefs as superstition, and we explain them as such.

This individual's concerted effort to use both traditional and scientific knowledge systems to make clear the blurred line between reality and superstition among the Kichwa cultural worldview is apparent as he walks through his service routines. A strong belief in his own style of tourism conveys a rivalrous tone to the above statement. Raul implies that some visitors receive untrue information masked as indigenous folklore. Any visitor attending a tourism service that touts such erroneous interpretations of local legend misses an opportunity to obtain a more 'accurate' representation of local cultural knowledge, and in the process, the opportunity for that local knowledge to be sustained through tourism is subtracted from the original pool of earning opportunities that each international visitor represents. The rivalry evident in Raul's tone is therefore unsurprising given these circumstances.

Across the river from Misahuallí, the community of Shiripuno invites both day and overnight visitors to their tourism compound. When asked about tourism experiences among this project, Raul quickly revealed a sense of rivalry towards the project, specifically related to their interpretations of the *pedra sagrada* (sacred rock) on their tourism compound:

Twenty years ago, the rock wasn't magic. But when tourism started, and they could start making money off of it, it became magic. When visitors come and are told lies like this, I feel badly. This isn't what I want in my business. We have a lot of humility to be able to say

'I don't know' ... I don't go to Shiripuno. I don't like when they give information that isn't correct.

Here, Raul articulates his efforts to actively subtract the opportunity from potential guests to visit this particular project and take in an 'incorrect' interpretation of local knowledge. Although Raul was the only informant to touch upon the fact that he refuses to patronize a certain project with his guests, he clearly articulates his reasoning as disagreement with untrue projections of the local knowledge system. In his opinion, that Shiripuno projects traditional knowledge devoid of any 'logical' scientific or historical explanation is reason enough to refuse them business.

In the case of local knowledge commons, rivalry thus manifests when one user of the resource disagrees philosophically with another user and chooses to actively avoid supporting them with more visitors. Although success of the business model in Shiripuno has been shown to lead to positive social outcomes for the community's women (authors, 2015), Raul provides evidence of at least one tourism operator in the area choosing to avoid the project. In this example of subtraction stemming from rivalry, the ability of the Shiripuno lodge to empower women through personal income is diminished.

Non-excludability of traditional knowledge

Indigenous, native, and foreign individuals in and around Misahuallí all engage in the local tourism market and as a result, draw upon traditional knowledge resources. Guides are the main source of communicated local traditional knowledge to visitors who engage in tourism activities in the area. Although licensing processes were not explicitly incorporated into interview questions, informants frequently touched on this theme because of its relevance to their activities. As part of the Napo Province, Misahuallí falls under the jurisdiction of that branch of the Ecuadorian Ministry of Tourism. According to this ministry's website, one of five main services provided by the branch is 'Tourism Guide Licensing.' Each level of guide (Local, National, Specialized-National) contains a specific list of requirements, and National level requires a 'knowledge test.' An example of the test is provided on the site intended for use by prospective National Tourism Guide license candidates, and contains such questions as: (1) when do lakes in the Amazon present the greatest number of species?; (2) what type of vegetation categorizes a cloud forest?; (3) what, specifically, is the backstrap loom used to weave?; (4) what is the definition of a leader?; (5) by whom is Executive Power of the State directed and controlled?; and (6) what comprises good service to a client? This subset of questions from the 100-question exam exemplifies the range of knowledge required of all National Tourism Guides throughout Ecuador.

Local Guides, who are able to work in Misahuallí, must attend a month-long training course, must have a Bachelor's degree issued by a legally recognized Ecuadorian Institution, and must pay a fee at their inception in addition to fees per renewal. They are not required to take the above-mentioned exam. In the case of these local guides, exclusion occurs not on the basis of tested knowledge, but on the basis of education level and the associated ability to pay certification fees. The comments of Lonnie, an agency co-owner and manager in the Misahuallí town center, sheds light on issues of non-excludability by noting that there are benefits and drawbacks to exclusively contracting licensed

guides when there are visitors looking for a tour. When asked if it is difficult to find guides in Misahuallí he responded:

It's not very difficult. The problem with un-licensed guides is that they haven't taken the course. They are people with a lot of knowledge, but they don't have credentials. There are other guides here and in Tena who have the credentials, but they aren't looking for work. But there are still other people that want to work with us and want to get their credentials but they cannot. For us, when we can't find a licensed guide, we are logically left with no other option but to contract a guide without a license. It's a delicate situation.

Although hesitant in his explanation, Lonnie points out two interesting phenomena among the guide situation in the Misahuallí tourism market. First, there are knowledgeable individuals in Misahuallí who simply do not have the time or capital to travel to Tena for the Ministry's course. They are excluded from guide licensing.

Second, it is often the case that licensed guides are all occupied at a given moment, and there is logically no other choice but to contract a reliable person for the tour, despite lacking official guide certification credentials. These individuals are not excluded from guiding visitors to the area and interpreting local knowledge, despite not attending official courses regulated by the state. Thus, the institutions governing the pool of cultural knowledge, as well as other guide-specific knowledge, are challenged to maintain excludability, leaving the cultural resources and traditional knowledge to be characterized as common pool resources.

Further evidence of non-excludability manifests throughout the town center, where local young men are frequently observed wandering common gathering places (e.g. open-air bars and eateries) looking for tourists, especially young adult tourists. These individuals target visitors who might want to explore local waterfalls, lagoons, and trails in a less-official, informal setting. Often, small amounts of money were requested for the experience including maritime passage fees and land entrance fees, though this is presented as a cheaper alternative to the use of official guides. In at least one case, fees were said to be 'paid' ahead of time by the solicitor so that tours could proceed unencumbered.

Informal interactions with townspeople revealed that these young men were rarely licensed guides. Informal interviews with two of them confirmed that they were working illegally sans certification. In terms of exclusion, it is apparent that the official certification process via the Ministry of Tourism to train and prepare tour guides is not excluding others, who are still able to engage in tourism services through guiding and interpreting for visitors. Difficulty delineating the resource boundary is another characteristic of a non-excludability, and thus supports the characterization of local cultural resources and knowledge as a common pool resource (Briassoulis, 2002). The exclusion of potential users from accessing local guide status would be prohibitively expensive for the Ministry of Tourism to continually patrol the Misahuallí town center for unlicensed guides. Existing institutions thus remain ineffective for excluding access and thus preventing overuse of these cultural resources.

Governing the cultural commons in tourism Contexts

Government ownership has long been touted as the most effective external management regime (Hardin, 1968). The Ministry of Tourism office in Tena provides guide-licensing

services to individuals that invest time and money for required courses and exams. This government program equips guides, who eventually become the gatekeepers of traditional knowledge for tourists to the area. The national government's guide licensing program provides an example of external management (Ostrom et al., 2012) of the local knowledge commons operating within the Misahuallí tourism market. The vast majority of licensed guides operating in the Misahuallí tourism market have attended the course.

Yet the idea that external management is necessary to effectively govern common pool resources been challenged by those acknowledging the effectiveness of other forms of collective action (Agrawal, 2001, 2014; Ostrom, 1990). Where internal governance solutions form, certain 'design principles' are typically present: (a) rules governing the use of resources are adapted to local environmental and climatic conditions; (b) the ability to undertake collective decision-making is evident; (c) enforcement of the governance system through monitoring, conflict resolution, and sanctions takes place; and (d) recognition by higher authorities of local attempts at self-determination occurs (Ostrom et al., 2012).

Here we narrow the focus to one particular indigenous tourism project to illustrate the ways that informal management via community-level collective action can materialize around the governance of cultural resources and traditional knowledge in the context of tourism. The community of Shiripuno, located across the Napo River from Misahuallí, and the Amukishmi women's group who operate a small ecolodge provide this example of an internal governance system. In adherence with the first design principle related to resource use (Ostrom et al., 2012), the first page of Amukishmi's legal statute champions value for such things as

the language, arts, customs, traditions, and ways of life of the Kichwa nationality which pertains to the members of the Association ... [and to] implement programs to elaborate and commercialize traditional products of the area, crafts, natural medicines, *comida típica* ... in order to appropriately meet goals.

It is clear in the Amukishmi project that stated goals or rules governing the knowledge resources are directly incorporated into tourism services and are adapted to local cultural conditions.

The second design principle related to collective action around common pool resources involves the responsibility for decision-making related to the resource (Ostrom et al., 2012). Collective decision-making manifests in two ways with Amukishmi. The existence of an organized and functioning association in itself requires a degree of collective action. Amukishmi has been present from the time this statute was drafted and legitimized by the national government through to today's current operation of an association and ecolodge. Amukishmi's collective action was also influential on the decision of the Shiripuno president to reject an oil pipeline through community land in 2012. Amukishmi's has demonstrated the ability to engage in collective decision, fitting well with the above-outlined design principles for effective internal governance of a commons (Ostrom et al., 2012).

A third design principle for internal management of common pool resources involves resource monitoring, resource conflict resolution, and sanctions for rule violations (Ostrom et al., 2012). All of these design elements are also evident in Amukishmi's formal statute. The statute is read aloud in association meetings every two months in order to reinforce stated rules requiring associates to, 'attend meetings punctually ... completely pay regular fees ... complete in full the positions to which you were assigned ...' among other

obligations. This explicit outlining of rules and the elaboration of specific sanctions (e.g. verbal reprimand, fines, and expulsion from the association) characterize this third design principle. Conflict resolution is likewise outlined in the statute wherein any sanction thought to be unjust can be brought before the community's General Assembly (made up of elected representatives), which will arbitrate the conflict. Through these mechanisms, the third design principle manifests to effectively govern Kichwa cultural values and traditional knowledge.

Lastly, the fourth design principle for internal management of cultural resources and traditional knowledge involves recognition by higher authorities (Ostrom et al., 2012). The Amukishmi statute has been legitimized by the Ecuadorian Ministry of Social and Economic Inclusion, as has their associated ecolodge, providing a hallmark example of recognition by a higher authority. Due to a presence of all four design principles (Ostrom et al., 2012), it is apparent that Amukishmi has formed an effective internal governance regime for managing indigenous knowledge through associated tourism activities. This example of internal governance of a common pool resource is noteworthy among projects in the Misahuallí tourism market and thus provides insights into the ways that positive social outcomes related to indigenous knowledge and culture can be supported by internally owned and operated, and externally recognized, forms of tourism.

Discussion

The first question guiding this research explored how the qualities of resource subtractability and non-excludability manifest in cultural resources and traditional knowledge in the Misahuallí tourism market. In the preceding sections, numerous ethnographic accounts of the ways in which traditional knowledge manifests as a common pool resource, specifically in terms of subtractability and non-excludability, have been articulated. The evidence shows that among the local tourism market, the knowledge resources communicated by indigenous, non-indigenous native, and foreign service providers, and used by their visiting tourists, is indeed subtractable, that is to say, its use by certain individuals limits the abilities of others to use the same resources. Likewise, the opportunity for service providers to grow and innovate their own knowledge along with that of foreign guests is only available to some, and that experience is likewise subtracted from those who are unable to engage with international visitors.

Tourism provides the link between these cultural resources and market values, and thus links cultural resources and traditional knowledge to incomes and livelihoods. Outcomes associated with lucrative language skills are limited to a subset of guides and providers, causing earning opportunities related to traditional knowledge to be subtracted and thus leading to rivalries over the culturally appropriate ways to represent traditional knowledge. Furthermore, non-excludability among the knowledge commons is mainly exhibited through the inability of guide licensing programs to effectively govern (i.e. exclude) traditional knowledge as used in the tourism context. Despite an official process by the Ministry of Tourism to train and prepare would-be guides, unofficial guides openly engage in tourism services through guiding and interpreting for visitors to the area. Yet such exclusion could be occurring both ways. Further research might explore the extent to which costly certification programs lead to the pecuniary exclusion of the most traditional forms of indigenous culture and knowledge. For now, the evidence

provided here provides strong support for the characterization of traditional knowledge as a common pool resource. This approach linking common pool resource theory to the study of tourism thus holds much promise for both research and management in indigenous tourism markets like those in Misahuallí.

The second question guiding this research asked in what ways are the existing management and governance regimes of the knowledge commons in Misahuallí influenced, both positively and negatively by the growing presence of tourism in this community? Governance of common pool resources should be 'polycentric' with various entities having some role in the process (Ostrom et al., 2012). Our analysis reveals both external (i.e. government) and internal (i.e. community collective action) forms of governance of the traditional knowledge commons in and around the Misahuallí. The indigenous-owned and operated Amukishmi women's association and the ecolodge they operate provided a complete example of the design principles associated with effective internal management of common pool resources, further substantiating the value of applying common pool resource theory to the governance of culture and traditional knowledge resources in the context of tourism.

Yet not all tourism projects in Misahuallí exhibit the characteristics of Amukishmi. As Acheson (2006) notes, key to more favorable outcomes are resource governance structures tailored to the specific economic, political, ecological, and social circumstances. Evident in this analysis are failures among the formal, external government level of management responsible for preparing local guides to serve as gatekeepers of knowledge to be imparted upon tourists. A potential solution might be to provide guide classes *in situ* to increase accessibility for locals with time or travel restraints related to the required month-long training. The removal of the university education prerequisite might also open up this opportunity to indigenous residents who maintain advanced level of traditional knowledge but who are unable to achieve licensing. More obviously, a locally contextualized exam related to not just the spectacular biological diversity of the Amazonian region, but also its high cultural diversity, would ensure that certified guides are equipped to provide accurate descriptions of the cultural worldviews that are as endangered as their biological counterparts (Gorenflo et al., 2012). Investing in such localized certification would likely improve the employability of guides as well as enrich the experience for visitors.

Conclusion

Focusing on the application of common pool resource theory to culture and traditional Amazonian indigenous knowledge, this paper illustrates the ways in which knowledge exhibits the characteristics of subtractability and non-excludability, qualities of common pool resources. This novel application of common pool resource theory to the governance of traditional knowledge in the context of tourism opens up new avenues considering how the sustainability and resiliency of local indigenous culture can be improved. This is a timely topic given the particular set of challenges faced by indigenous peoples across the planet. As globalizing markets enter into their spheres of activity, there is a resulting loss of diverse natural resources, a loss of political, social, and economic autonomy, and a loss of traditional or locally based knowledge (Lu & Bilsborrow, 2011). In the Ecuadorian Amazon in particular, extractive industries, largely focused on the region's petroleum

reserves, provide little or no opportunity to reconcile these challenges as land is taken and contracts are forgotten (Sawyer, 2004; Smith, 2014). While tourism can also be a force that disrupts social and environmental systems in the Ecuadorian Amazon, it may also be a valuable alternative to other global forces by providing opportunities to showcase and preserve indigenous culture and knowledge. As the tourism industry continues to expand into indigenous territories around the planet, it is compulsory that scholarly inquiry into the forms of tourism occurring among Earth's most biologically and cultural diverse areas documents the changes created by tourism and highlights the situations where tourism provides opportunities for environmental and cultural preservation that would otherwise not exist. The integration of theory on traditional knowledge and common pool resource theory will be essential to advancing our understanding of tourism and cultural change.

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