Tapping into geotagged photos posted on Flickr helped researchers understand tourist preferences for recreational visits to Kerala’s wetlands and enabled them to link visitation with conservation planning.

Their study showed improving water quality to a level suitable for the preservation of wildlife and fisheries could increase annual recreational visits by 13 percent (350,000 visits) to wetlands across the state.

Recreational benefits are expected to be more substantial for wetlands classified as having the poorest water quality. With World Wetlands Day falling on 2nd February, we look at how restoring wetlands can bring positive economic returns to local stakeholders and tourism industry alike.

Ever thought your vacation photos could help decision-makers conserve nature and further enrich your travel?

An Indo-Israeli joint study has sniffed out geotagged photo data from popular image hosting service Flickr to aid conservation planning of Kerala’s famed wetlands in alignment with tourist visits.

The crowdsourced information analysis conducted jointly by the University of Haifa in Israel and the Department of Environmental Sciences at the University of Kerala provided a trove of information that enabled the researchers to understand people’s preferences and behaviour when visiting a natural area. A key finding of the project jointly funded by India’s University Grants Commission and the Israel Science Foundation is that improving water quality to a level that supports wildlife and fisheries could increase annual recreational visits by 13 percent in the wetlands, which are currently experiencing lower water quality standards. This technique using social media users as “environmental sensors” can be stepped up further to calculate the economic value of recreation (and how it would be affected for instance by changes in water quality), said Andrea Ghermandi of the University of Haifa in Israel. Explaining the basis of the methodology, Ghermandi said that previous studies have shown that there is a good correlation between the number of photographs uploaded from a specific location and the number of visitors. “Our idea was to use this insight to explore the relationship between environmental quality and recreation/tourism in wetlands in Kerala,” Ghermandi, principal investigator of the project in the Middle Eastern country told Mongabay-India. The southern state made USD 4.5 billion in 2016 from the tourism sector alone. It pulled in more than double the number of visitors in 2016 from India and abroad as
An Indo-Israeli joint study has tapped into geotagged photo data from popular image hosting service Flickr to aid conservation planning of Kerala’s famed wetlands in alignment with tourist visits. Screenshot from Flickr. Boasting of three Ramsar sites including the state’s most visited Vembanad Lake, the scenic lakes and backwaters form the backbone of the state’s tourism industry. The wetlands ecosystem in the state provides myriad opportunities for boating, biodiversity and appreciation of the local culture that form the crux of recreational experiences. But the water bodies are battling pollution, reclamation and encroachment, with the tourism sector contributing to a deterioration in water quality. This could, in turn, have a counter-effect on the state’s rapidly growing tourism industry itself, the researchers fear.

Putting a number on it
Sabu Joseph of the University of Kerala and principal investigator of the project in India pointed out that the crowdsourced data approach, despite limitations, comes in handy when field surveys can consume time and money, especially for a state like Kerala that has the largest proportion of land area under wetlands among all the states of India. “At the same time the tourism industry is growing rapidly but the local natural capital is undergoing substantial depletion,” Joseph said. Then again, indirect support given by wetlands goes largely unrecognised, remarked Sheela Moses of the Kerala State Pollution Control Board. Placing a monetary value on ecosystem services (such as recreational benefits) offered by these wetlands makes the indirect and unacknowledged benefits of these wetlands visible and comparable, enabling policymakers to see the true economic value of a wetland and embed them into planning. Ecosystem services are the benefits people receive from nature. Valuing such recreational ecosystem services is very important for the local community too because it includes the benefits that local residents enjoy visiting the wetlands, said Ghermandi. “While taking development decisions, tourism is given importance but the wetlands that support tourism is not valued,” said Moses. “Many of the wetlands are at risk of degradation and conversion into other land uses because policy makers, planners and other stakeholders do not appreciate the range of benefits provided by these wetlands and the total economic value of these benefits,” she added. “Such benefits may be very important for the locals but are often overlooked in the official statistics (which focus on tourist expenditures, such as for hotel rooms or renting houseboats) because they are enjoyed as public goods, thus generally not involving market payments such as the above,” Ghermandi of the University of Haifa, said. Worldwide there is growing support for characterising ecosystem services in order to link conservation and human well-being. For example, a case study on Khao Yai National Park, one of Thailand’s oldest and most popular national parks, suggests that ecosystem services can be categorised into those that arise in association with direct uses such as recreation, tourism, and research. They also include various “non-use” values, such as people’s willingness to pay to protect species and habitats they may never see. Dipping into social media for Kerala’s wetlands Combing through image and video hosting service Flickr, researchers recovered as many as 47,246 Flickr photographs within Kerala’s borders between 1 January 2005 and 31 December 2016.

“We identified photos taken inside or in the proximity of wetlands, and matched them with different site-specific characteristics (like water quality) or context-specific characteristics (like total population living nearby),” said Ghermandi, retracing the steps of the study.
Combing through image hosting service and video hosting service Flickr, researchers recovered as many as 47,246 Flickr photographs within Kerala’s border between 1 January 2005 and 31 December 2016. Photo by Andrea Ghermandi. These characteristics were explored for 81 wetlands in Kerala, which were chosen based on the availability of water quality data from the Kerala State Pollution Control Board. Finally, a statistical analysis lets one infer how visitation is correlated with the variables of interest, including water quality. Some of the wetlands that are experiencing the poorest level of water quality, such as Vembanad and Ashtamudi, were, in fact, the most visited. And recreational benefits are expected to be more substantial for wetlands classified as having the poorest water quality. The two Ramsar sites on the list, Vembanad Lake and Ashtamudi Lake, which are in the poorest water quality category, could, for instance, benefit by an additional 53,500 and 30,000 visitors per year, the study said. “The recreational benefits include boating (e.g., in houseboats) as well as landscape and aesthetic appreciation from for instance walking on the shores of the lakes or wetlands,” Ghermandi said. Vembanad Lake, which has lost almost seven percent in surface area could benefit by an additional seven percent in visitation if this area was restored. Ashtamudi Lake, which has recently lost 10 percent of its area would also benefit by a seven percent increase in visitation if this encroached area were reclaimed.

In Ashtamudi Lake, where water quality is so poor that its classification cannot be further downgraded as no lower threshold is currently recognised in the state, hotel-stay trends have changed in sync with what appears to be declining water quality.

If action is taken to ensure that the wetland areas and water quality are restored, the tourism industry, as well as local stakeholders, should see positive economic returns from increased visitation, emphasise the authors in the study. "Use of social media data and ecosystem service valuation feeds into the bigger picture in terms of policy-how do we ensure the community derives benefits from tourism and in turn contributes to the preservation of the sites," said Joseph of Kerala University. An earlier study of the Indo-Israeli project estimated that Vembanad Lake provides recreational ecosystem services worth more than Rs 700 crore. From the ongoing work on ecosystem service valuation in Ashtamudi lake, Joseph believes, the valuation data will provide a real picture of the revenue generation for the 13 panchayats surrounding the lake. "The economic valuation can be estimated for the entire lake system and a share of the adjoining panchayats can also be estimated," Joseph said. "For example, in Ashtamudi lake, the prominent ecosystem services include provisional services like providing fish, prawn, clam shells; regulating services like controlling flood, flow, carbon sequestration and climate change control; cultural services like tourism promoting, aesthetics, recreation etc." Joseph explained. Once a monetary value is placed on ecosystem services, it can be dovetailed with management plans such the
Integrated Management Planning Frameworks (IMPFs) for the conservation and wise use of Vembanad and Ashtamudi Lakes which highlights wetland pollution and lake shrinkage as key issues for the sustainable management of wetlands in Kerala. “In response to deteriorating wetland quality, the IMPFs have detailed the necessary budgets for the restoration and sustainable management of each wetland. The enhanced knowledge of the services to the panchayats enable the local self-government to effectively implement the various rejuvenation programmes,” added Joseph.