Surfonomics Lobitos, Peru

The economic impact of surf tourism on the local economy

Marcos Abilio Bosquetti
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SandS UFSC
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Peru's North Coastline - 3D Map: Google Earth

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Sunset in Lobitos - Source: EcoSwell's Photo Collection

Waves of Lobitos - Photo: Henry Espinoza - Source: Henry Espinoza Photography

Introduction

Lobitos is a very small town on the far north coast of Peru. Blessed with year-round swells, miles of empty coastline, a multitude of breaks, friendly locals and a thriving culture, this is Peru's little gem with a natural vocation for surf tourism. The small community of local fishermen and surfers are slowly rebuilding the town out of the literal ruins of a once booming oil town and a Peruvian military base, turning the village into an international surfing destination.

The world-class waves of Lobitos are a vast natural coastal resource with an enormous social and economic value that is under-estimated by political leaders and local communities. With harmful coastal developments, lack of urban planning for the construction of hotels, and inefficient solid waste management, the surfing and coastal resources in Lobitos are under threat. It is essential, therefore, to understand the benefits of this world-class surf spot to the local economy in order to guide policy makers towards sustainable development.

This empirical study attempts to estimate the direct contribution of surf tourism to the local economy of Lobitos by applying surf economics, informally known as "Surfonomics". This is a method that uses direct expenditure data from visiting surfer tourists to estimate the economic value that a world-class wave brings to the local community.

This Surfonomics project is led by EcoSwell, a non-profit organization whose mission is to design and develop socio-environmental, educational and infrastructure projects with the purpose of guiding the development of vulnerable communities through a path towards sustainability. This project is an initiative to ensure the wave breaks in Lobitos are treated as sustainable natural assets through their proper economic valuation. the end result will be to ensure that the interests of local fishermen and the surf economy - which are low impact on the environment - can be safeguarded.

The Surfonomics model, created in California and applied in six countries, was adapted to the Lobitos context. The standard surfer tourist survey was amended to allow the local community, and tourism business operators, to have a better understanding of tourist's expectations and their opportunities in order to improve their experience in Lobitos.

All primary data was collected in Lobitos throughout 2019 and in the first months of 2020 through individual face-to-face survey interviews conducted with 202 surfer tourists and 23 managers of local hotels. Data was analyzed using descriptive statistics to present the findings of this quantitative research.

To our knowledge, this is the second Surfonomics study conducted in Peru after a 2015 study in Huanchaco, a popular vacation beach town and famous surfing destination on the northwest coast of Peru. Due to the absence of surf tourism studies in Lobitos, we use some findings of the Huanchaco study in the discussion of the results to widen the understanding of the present empirical study.

We hope that this study can help decision makers make better choices to preserve the surf resources in Lobitos for future generations, inspire future surf tourism research in Peru, and help with the creation of a national database for this growing segment of the tourism industry.

The following pages include: i) Surfing Lobitos, ii) the main threats to the ecosystem and the future of surfing in Lobitos, iii) a brief overview on Surf Economics, iv) the method used in this research, v) the results of this empirical study, vi) a brief discussion, and vii) the final conclusions.

Waves from the shore - Photo: Henry Espinoza - Source: Henry Espinoza Photography

Surfing Lobitos

On Peru's northern coast, twenty minutes away from the traditional fishing and oil extraction city of Talara, lies the small town of Lobitos. With approximately one thousand inhabitants, Lobitos has had extraordinary opportunities for development throughout its history. During most of the 20th century, British Petroleum (BP) and the International Petroleum Company (IPC) prospered from oil extraction in the area. The fishermen remember these times fondly. They had better access to education, beautiful English style urbanization, a marketplace and even the first cinema in South America.

The 1968 military coup changed Lobitos forever. Oil assets were nationalized, forcing foreign companies to leave. The town's architecture slowly degraded, and the fishermen declined into poverty. In the early 2000s, however, surfers started arriving in the town from all over Peru and abroad, seeking the world-class surf spots that decorate the shoreline. This new touristic boom brought more income into the town, calling for proper management by local authorities and grassroots organizations so as to ensure its sustainability.

Lobitos is very consistent in terms of surfable swell. The surf season is divided into two main seasons: Winter (June to October) being the peak season in terms of the best southerly and south-westerly long period swells; and Summer (November to May) which is not as big or consistent, but it is the time when Lobitos will receive its northerly swells and where the wind is low in comparison. In the months between December and February very glassy mornings and surf sessions in board shorts can be expected. There are at least seven great spots concentrated in less than a 5km stretch of beach. Starting at the southern point moving northwards, Baterias, El Hueco, Frontera, La Punta, Generales, Piscinas, and Punta Panamá are the main surf spots.

Baterias is the southernmost wave of the locality. The shoreline of this area is very exposed which makes the wave stronger. Baterias is open, huge, and crashes down into the rocky shore. It is a long and fast wave with multiple sections suitable for different surfing styles. During low tide, you can expect great barrel sections and maybe even some small ones down the beach. The peak months for this wave are August through to November.

El Hueco is the locality's most advanced wave. It crashes into the western most point of the district. There is no sand at this point and so the wave crashes right onto the reef. This is one of the biggest waves ranging from 2.5 - 3.5 meters. El Hueco is the most iconic wave in the region known for its heavy barrels. It works best at low tide with a good swell for it to break. The peak months for this wave are June through to November.

Frontera is a fast barrelling wave that breakes from El Hueco all the way to La Punta. It is a left hander that rides next to the rock reef. This wave peaks at low tide.

La Punta is the most well known wave in the area. It is a beginner to intermediate beach break wave. It moves slowly providing ample time to stand up. This wave is soft peeling, long, and strong. It can provide hard shoulders, barrels, and bowls. La Punta is great for a longboard but can also be fun on a shortboard too. This wave is at its best in the late winter months.

Generales is a smaller wave ranging from 0.5 - 1.5 meters. It is a fast barreling beach break, great for shortboard riding. This wave works best when a strong northern swell roles in. Its peak months are December to February.

Piscinas is another consistent favorite. It is an intermediate to advanced wave. It ranges from 1.5 - 2 meters and is a playful left hander. This long riding wave can sometimes provide barrels on the outside and inside sections. The length of the ride can get up to 100 meters with lots of different sections throughout. The peak months for this wave are March through to July.

Punta Panamá is a right-hander, curved 2 meter wave that is born deep in the ocean and ends barreling heavily over the Piscinas beach shore. It's a paradise for the intermediate and advanced regular footer, but it only works during the windless mornings of December to February.

Lobitos has many other surf spots to the north and south of the touristic area with great potential for further surfer tourism development.

El Hueco, Lobitos - Photo: Henry Espinoza - Source: EcoSwell's Photo Collection

The Statues - Photo: Nicolás Landa - Source: EcoSwell's Photo Collection

Threats to Lobitos

The discovery of Lobitos' world-class waves began a new cycle of prosperity to the small village, however, Lobitos was not ready for the surf tourism boom.

There are no legal parameters in place to guide the construction of hotels and hostels, so many were built very close to the shore at La Punta, the most popular wave break. The buildings impede the replenishment of the sand banks and have ultimately affected the quality of the wave break.

Additionally, the town is lacking fundamental public services required for its public and environmental health. The old sewage system has collapsed, and the solid waste management is informal and inefficient, especially when handling the higher influx of tourists during the summer months. These issues are highly noticeable around the town, potentially dissuading tourists from returning or recommending the destination.

Sadly, the local fishermen have not reaped the benefits of the town's development. It is impossible for the fishermen to compete with foreign investors and capitalize on the economic growth, so they remain in poverty. In the past, they have been supported by the Municipality which was able to pay salaries through oil tax funds. However, these funds are rapidly declining which means it has become imperative that the Municipality change its strategy and embrace surf tourism as an economic alternative to oil.

This Surfonomics study aims to estimate the direct contribution of surf tourism to the local economy of Lobitos and highlight the importance of investing in infrastruture and solving local environmental issues in order to improve the tourist experience. The finding's of this empirical study can be used to support the development of public policies which account for the main environmental threats listed here. This in turn will help guarantee the sustainable development of the town's tourism industry.

Surf Economics

Surfing is a free recreational activity that is practiced by approximately 35 million people worldwide (O'Brien & Eddie, 2013). In search of perfect waves, surfers are regularly engaging in surf tourism across the globe (Buckley, 2002; Ponting, 2009), impacting thousands of coastal communities (Martin & Assenov, 2012; Ponting & O'Brein, 2015; Mach & Ponting, 2018).

As harmful coastal developments and pollution threaten surf spots, the evaluation of economic benefits derived from surfing, informally known as Surfonomics, has been utilized by internationally renowned enviro-surf NGOs such as the Surfrider Foundation and Save The Waves Coalition to fully account for the economic benefits to communities from surf tourism and promote coastal conservation.

Surf economics or Surfonomics applies natural resource economics to better understand the economic value of waves and surfing to local communities, as well as the consumer surplus that surf breaks provide to millions of surfers (Nelsen, 2012).

Surfonomics has contributed to Save The Waves' World Surfing Reserves Program as an advocacy mechanism to influence government policies and help decision makers make better choices to protect key environmental, cultural, economic, and community attributes of world-class surf breaks and their surrounding areas (Save The Waves, 2019).

Over the past decade, Save the Waves has commissioned seven Surfonomics studies. Four of them were carried out in World Surfing Reserves: Pichilemu, Chile (Wright, Hodges & Sadrpour, 2014); Huanchaco, Peru (Hodges, 2015); Bahia de Todos Santos, Mexico (Hodges, 2015); and Guarda do Embaú, Brazil (Bosquetti & Souza, 2019). The other three were carried out in Mundaka, Spain (Murphy & Bernal, 2008); Mavericks, USA (Coffman & Bur-nett, 2009); and Uluwatu, Indonesia (Margules, 2014).

In Australia, a similar study carried out by Neil Lazarow was commissioned by the Gold Coast City Council to support the city's shoreline management plan (Lazarow, 2009). All of these studies applied the Direct Expenditure Method of economic evaluation to estimate the market value of surfing for the local economy. The results of these eight studies sum up to US$250 million per year.

Surfing also produces significant non-market value, which comes from the welfare and benefits that surfing provides to millions of surfers, that cannot be measured by the Direct Expenditure Methods. The most common type of non-market value studied in surfing is consumer surplus, estimated by the Travel Cost Method. It represents the aggregate willingness-to-pay above and beyond what people are currently paying to reach the surf location (Scorse & Hodges, 2017). Chad Nelsen, CEO of the Surfrider Foundation, applied the Travel Cost Method to estimate the non-market value of surfing at Trestles, California, and found an average consumer surplus of surfing to be US$138.00 per person per visit (Nelsen, 2012).

The non-market value of surfing can also be estimated by the Hedonic Price Method. As surfers choose to live close to surf spots, they have no travel costs. However, they pay much higher prices for a house. Therefore, part of the non-market value of surfing would be capitalized into real estate value. Scorse, Reynolds & Sackett (2015) applied the Hedonic Price Method to study the impact of surf breaks on home prices in Santa Cruz, California, and found that beach houses close to surf spots are worth hundreds of thousands of dollars more than similar beach houses far from surf spots.

This brief overview shows the main methods used in empirical studies on the nascent field of Surfonomics. The next section presents the methodology applied in this present research.

Fishermen and Surfers - Photo: Henry Espinoza - Source: Henry Espinoza Photography

Research Method

To estimate the contribution of surf tourism to the local economy of Lobitos, this empirical study applied the Direct Expenditure Method of economic evaluation. The Surfonomics model applied in the World Surfing Reserves of Pichilemu, Chile (Wright, Hodges & Sadrpour, 2014); Huanchaco, Peru (Hodges, 2015); Bahia de Todos Santos, Mexico (Hodges, 2015); and Guarda do Embaú, Brazil (Bosquetti & Souza, 2019) was adapted to the Lobitos context. Like the research method applied in the study of Guarda do Embaú, Brazil, two surveys were designed to collect data from two distinct sources: surfer tourists and managers of the lodging businesses in Lobitos.

Data Collection

The field survey questionnaire designed to interview surfer tourists was prepared to collect not only data on the surfer tourists' demographics and their spending patterns, but also on their perceptions of Lobitos as a surf destination. The survey questionnaire designed to interview managers of the local lodging businesses (hotels, inns, hostels, surf camps, etc.) was designed to collect data on bed capacity, occupancy rates, percentages of surfer guests, and their average length of stay.

Before starting the collection of primary data, both surveys were pre-tested at the end of 2018 to address potential issues, improve the questionnaire and the approach of the interviewers. The face to face interviews with surfer tourists were conducted throughout 2019 to cover the seasons of the year, while the face-to-face interviews with managers of the lodging businesses about the 2019 season happened in the beginning of 2020. The survey questionnaires can be found in the Appendices.

In order to interview surfer tourists, this study used Convenience Sampling, which is a method for selecting the interviewees based on their proximity to the research site (Creswell & Creswell, 2018).

The interviewers approached surfers on the beach asking if they were locals or tourists, then asked the survey questions to the surfer tourists and wrote their answers on the form. Regarding the survey designed to collect primary data on accomodations in Lobitos, the interviewers visited the lodging businesses, asked the questions to their managers and wrote the answers on the survey form.

The team of interviewers collected usable responses from 202 surfer tourists and 23 managers of local lodging businesses.

As Peru lacks research on surf tourism in the northern region, no secondary data were found to support this empirical study.

Fieldwork – Photo: Alejandro Pizarro- Source: EcoSwell's Photo Collection

Data Analysis

All data collected were entered manually in a database and analyzed using descriptive statistics to present the findings of this quantitative research.

This Surfonomics study calculates the number of surf tourists visiting Lobitos by using data on the village's capacity for tourism accommodation gathered from local advertising websites, Booking.Com, and AirB&B as well as data collected from managers of 23 local lodging businesses during the face-to-face interviews related to beds capacity, average occupancy rates, and the percentages of surfer guests.

The number of surfer tourists visiting Lobitos is given by the multiplication of the following variables: beds capacity, average occupancy rate, average percentage of surfer guests, monthly tourists turnover rate (days in the month/average length of stay), and months of operation per year.

Regarding the direct contribution of surf tourism to the local economy, this is calculated through multiplication of the following variables: number of surfer tourists, average daily expenses per person, and length of stay in days. Transportation costs to reach Lobitos were not included in the calculations, as it has very little to no direct impact on the local economy of the surf village.

Study Limitations and Suggestions for Further Research

Data on beds capacity, occupancy rate, percentages of surfer guests, length of stay, and average daily spending in Lobitos were estimated by surfer tourists and managers of local lodging businesses during the survey interviews and no confirmation of registered data was available.

Surfonomics Lobitos is a case study that uses a non-probabilistic method of data collection (Convenience Sampling) and is not random so the findings cannot be extrapolated to the population of surfer tourists or to other surf villages.

Further studies using the Travel Cost Method and the Hedonic Price Method in the real estate market to estimate the non-market value of surfing to Lobitos could provide a more holistic economic evaluation of surfing resources.

Future Surfonomics studies carried out in surf tourism destinations near the capital city of Lima could provide more insights on the demographics and spending patterns of surfer tourists in Peru.

The Pier - Photo: Selcuk Bulut - Source: EcoSwell's Photo Collection

Results

This section presents the research findings related to the surfer tourists' demographics, their spending patterns in Lobitos, and their perceptions of this surf destination. The descriptive statistics presented in the tables below only refer to surfer tourists from the sample of this case study so it cannot be extrapolated to the population of surfer tourists or to other surf villages. The sentences in orange highlight the key findings of this Surfonomics study, the first empirical research on the value of surf tourism for Lobitos.

Age, Gender and Surf Level

Table 1: Surfer Tourists' Age

Age Range*	Frequency	(%)
16 - 18	7	3.5
19 - 25	69	34.2
26 - 33	86	42.6
34 - 41	19	9.4
42 - 49	6	3.0
50 +	4	2.0
No Answer	11	5.4

Around ¾ of the surfer tourists visiting Lobitos are in their 20's. The average age of the sample is 26 years old.

(*) Data were collected in years of age, but are presented in ranges to facilitate data visualization.

Table 2: Surfer Tourists' Gender

Gender	Frequency	(%)
Male	148	73.4
Female	54	26.6

Around ¼ of the surfer tourists visiting Lobitos are female

Table 3: Surfer Tourists' Surf Level

Surf Level	Frequency	(%)
Beginner	68	33.6
Intermediate	81	40.1
Advanced	48	23.8
Professional	5	2.5

The variety of surfbreaks available in Lobitos atracts tourists from all levels of surfing skills. Around ¾ of the surfer tourists visiting Lobitos are beginners or intermediate surfers. The other ¼ of the surfer tourists are advanced or professional surfers.

Yoga at La Casona - Photo: Diego Almendrades - Source: EcoSwell's Photo Collection

Surfing's Influence on Travel to Lobitos and Origin of Surfer Tourists

Table 4: Surfing's Influence on Travel to Lobitos

Surfing's Influence	Frequency	(%)
Primary factor	165	81.7
Secondary factor	37	18.3

For 81.7% of the surfer tourists, surfing is a primary factor influencing their decision to visit Lobitos. The other 18.3% of the surfer tourists in the sample stayed in the village primarily to undertake volunteering projects, but surfing also influenced their choice to volunteer in Lobitos.

Table 5: Continent Origin of Surfer Tourists

Continent Origin	Frequency	(%)
South America	92	45.6
Europe	71	35.1
North America	22	10.9
Australia	17	8.4

Surfer tourists visiting Lobitos come from 31 different countries located in 4 continents. 45.6% of the surfer tourists come from South America, followed by Europe (35.1%). Only 10.9% come from North America.

Table 6: South America Country Origin of Surfer Tourists

South America Country (n = 92)	Frequency	(%)
Peru	36	17.8
Brazil	21	10.4
Argentina	19	9.4
Chile	7	3.5
Ecuador	6	3.0
Uruguay	2	1.0
Colombia	1	0.5

Only 17.8% of the of surfer tourists visiting Lobitos come from Peru (domestic surf tourism), showing that the village is already an international surfing destination.

Table 7: Surfer Tourists' Education

Level of Education	Frequency	(%)
High-School Diploma	37	18.3
Some College/University	34	16.8
College/University Degree	85	42.1
Master Degree	41	20.3
Doctorate Degree	5	2.5

64.9% of surfer tourists visiting Lobitos have education at or above university level and 22.8% have a master or doctorate degree.

Alejandro at Piscinas– Photo: Bruno Furghestti - Source: EcoSwell's Photo Collection

Andrés at El Hueco - Photo: Jorge Herrera - Source: EcoSwell's Photo Collection

Travel Partners on the Trip, Length of Stay, and Perceptions of Lobitos

Table 8: Travel Partners to Lobitos

Number of Travel Partners	Frequency	(%)
None (solo trip)	75	37.1
One partner	72	35.6
Two partners	25	12.4
Three partners	22	10.9
Four partners	5	2.5
Five or more partners	3	1.5

72.7% of the surfer tourists travel solo to Lobitos or bring one travel partner with them. However, on average surfer tourists bring two partners on their trip to Lobitos.

Table 9: Length of Stay in Lobitos

Length of Stay*	Frequency	(%)
Up to 6 days	57	28.2
7 – 13 days	53	26.3
14 – 20 days	42	20.8
21 – 30 days	29	`14.3
31 days +	21	10.4

On average, surfer tourists and their travel partners stay 8 days at Lobitos.

(*) Data were collected in years of age, but are presented in ranges to facilitate data visualization.

Table 10: Environmental Issues that would Negatively Impact on the Decision to Return to Lobitos

South America Country (n = 92)	Frequency	(%)
Oil rigs/pump sites	74	36.6
Solid waste/trash (land/water)	68	33.6
Sewage overflow	26	12.9
Construction on the beaches	17	8.4
Deforestation	9	4.5
Other Issues	8	4.0

The four most frequently mentioned environmental issues that would negatively impact the surfer tourists' decision to return to Lobitos are: the presence of oil rigs/pump sites (36.6%), solid waste/trash (33.6%), sewage overflow (12.9%), and the construction on the beaches (8.4%). Deforestation, overfishing, and invasive species were also sources of environmental concern from surfer tourists.

The legacy of strong oil extraction activity in the region takes its toll on the tourists' perception of environmental issues in Lobitos.

Surfer Tourists' Spending Patterns in Lobitos

Table 11: Average Daily Expenditure per Surfer Tourist in Lobitos in 2019 in US Dollar

Category of Expenditure	Average Daily Expenditure per Surfer Tourist in Lobitos	(%)
Accommodation	US$13	24.6
Food & Beverage	US$21	39.6
Surf-related Expenses	US$7	13.2
Miscellaneous	US$12	22.6
Total	US$53	100.0

Research findings show that a surfer tourist visiting Lobitos spends on average US$53.00 per day in the village.

The relatively low levels of expenditures on accommodation may be partly explained by the high numbers of volunteers in social or environmental projects who often have subsidized lodging.

View of Lobitos from the Shores - Photo: Henry Espinoza - Source: Henry Espinoza Photography

Direct Contribution of Surf Tourism to the Local Economy of Lobitos

This Surfonomics study estimates the number of surf tourists visiting Lobitos by using data on the village's capacity for tourism accommodation (beds capacity) gathered from local advertising websites, Booking.Com, and AirB&B, as well as data collected from managers of 23 local lodging businesses during the individual face-to-face interviews.

The number of surf tourists visiting Lobitos is found by multiplying the following variables: beds capacity (439), average occupancy rate (53%), average percentage of surfer guests (82%), monthly tourists turnover rate (days in the month/average length of stay = 3.75), and months of operation per year (12).

The direct contribution of surf tourism to the local economy is calculated by multiplying the following variables: number of surfer tourists, average daily expenses, and average length of stay, as shown in the table below.

Table 12: Number of Surf Tourists and the Direct Contribution of Surf Tourism to the Local Economy of Lobitos in 2019

Surf Tourists	Average Daily Expenses	Average Lenght of Stay	Contribution of Surf Tourism
8,586	US$53	8 days	US$3,640,464

Research findings suggest that in 2019 surfing attracted 8,586 surf tourists to Lobitos. On average, they stayed for 8 days and spent US$53.00 per day in the village, contributing US$3.6 million per year to the local economy.

Surf Tourists Enjoying Sunset in Lobitos - Photo: Selcuk Bulut - Source: EcoSwell's Photo Collection

Discussion

Findings of this empirical study on the spending patterns and behaviors of surfer tourists visiting Lobitos show that on average a surfer tourist spends US$53.00 per day in the village, which is 20% higher than the US$45.00 found in the Surfonomics study carried out in Huanchaco, Peru (Hodges, 2015). This difference may be partially explained by the fact that as a small village in a remote location, Lobitos offers fewer accommodation and restaurants options for tourists than Huanchaco.

When comparing the figure found in Lobitos with Surfonomics studies conducted in other countries, it is a little less than the US$61.00 found in Guarda do Embaú WSR, Brazil (Bosquetti & Souza, 2019), but it is much less than the US$111.00 found in San Miguel WSR, Mexico (Hodges, 2014) and the US$159 found in Pichilemu WSR, Chile (Wright, Hodges & Sadrpour, 2014).

A direct comparison among these results may be jeopardized by differences between countries related to living costs, per capita income, local currency rates and differences between tourists' demographics.

This study suggests that in 2019 surfing attracted 8,586 surf tourists to Lobitos. On average, they stay for 8 days in the village and spend US$53.00 per person per day. Based on these findings, it can be estimated that in 2019 surf tourism in Lobitos contributed approximately US$3.6 million to the local economy. This figure represents a significant contribution of surf tourism to a small village of one thousand inhabitants. It has a much more important impact than an equivalent figure in a developed economy such as the USA or Australia.

If we had to describe the profile of the surfer tourists visiting Lobitos based only on the sample and findings of this Surfonomics study, we would say that they are on average 27 years old and that 26.6% of them are female. Surfer tourists visiting Lobitos come from 30 different countries located in 4 continents. 45.6% of them come from South America and 35.1% come from Europe, but only 10.9% come from the neighboring continent of North America.

In relation to domestic surf tourism, only 17.8% of the surfer tourists visiting Lobitos come from Peru, showing that the village is already an international surfing destination. 72.7% of the surfer tourists travel solo to Lobitos or bring one partner with them.

Elliott at El Hueco - Photo: Hugo Vela - Source: EcoSwell's Photo Collection

Around ¾ of the surfer tourists visiting Lobitos are beginners or have an intermediate level of surfing skills, while the other ¼ of them are advanced or professional surfers. For 81.7% of the surfer tourists, surfing is a primary factor influencing their decision to visit Lobitos, while the other 18.3% stayed in the village primarily to undertake volunteering projects, but surfing also influenced their choice for doing it in Lobitos.

64.9% of surfer tourists visiting Lobitos have an education at or above university level and 22.8% have a prostgraduate degree. In comparison with other Surfonomics studies, the surfer tourists visiting Lobitos are younger on average, have a higher proportion of female surfers, and have a higher level of education.
In terms of their perceptions of Lobitos as a surf destination, the four most perceived environmental issues that would negatively impact the surfer tourists' decision to return to Lobitos are the presence of oil rigs/pump sites (36.6%), solid waste/trash (33.6%), sewage overflow (12.9%), and construction on the beaches (8.4%). Findings reveal that the legacy of strong oil extraction the legacy of strong oil extraction activity in the region takes its toll on the tourists' perception of environmental issues in Lobitos. Another source of concern highlighted by surfer tourists is the in which the district deals with its solid waste and sewage.

This Surfonomics study used the most basic form of economic valuation known as Direct Expenditure Method to estimate the contribution of surf tourism to the local economy of Lobitos, so it does not capture the entire economic value of surfing.
Further studies could use the Travel Cost Method and the Hedonic Price Method in the real estate market to estimate the non-market value of surfing to Lobitos. However, findings of the present study are enough to show that Lobitos is a perfect example of how a small village can benefit from, and depend on, the preservation of a world-class wave.

Decision makers need to take into account that surf tourism is a non-extractive coastal resource that makes a significant contribution to the local economy of Lobitos.

EcoSwell Volunteers going for a surf - Photo: Alejandro Pizarro - Source: EcoSwell's Photo Collection

Conclusions

Using the Direct Expenditure Method of economic analysis we were able to quantify that surfer tourists visiting Lobitos spend on average US$53.00 per day. Research findings indicate that in 2019 surfing attracted 8,586 surfer tourists to Lobitos. On average, they stayed for 8 days in the village. The result of the multiplication of these variables suggests that in 2019 surf tourism contributed approximately US$3.6 million to the local economy, which is a significant contribution to a village of around one thousand inhabitants, considering the Peruvian socioeconomic context.

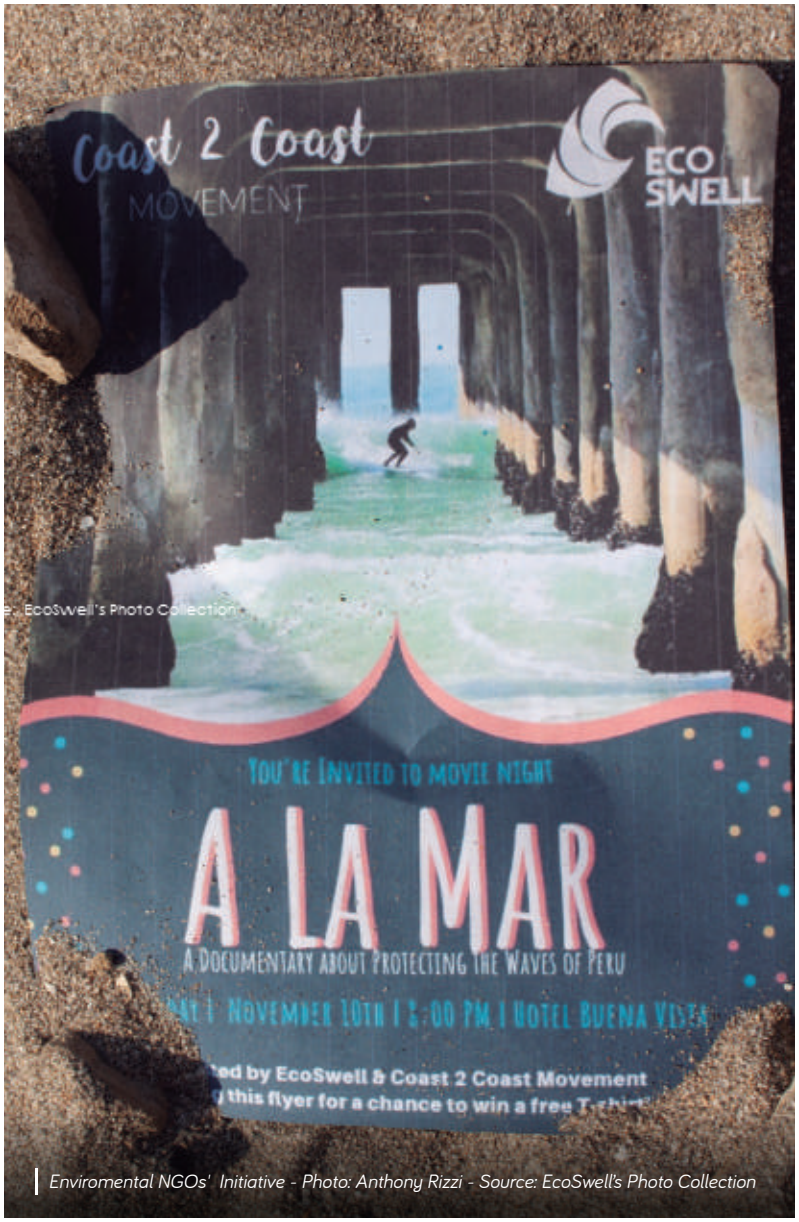
This empirical study shows that the economic impact of surf tourism on the local economy of Lobitos is substantial and should be considered when taking any coastal management decisions in the district. It also shows that the presence of oil rigs/pump sites, solid waste/trash, sewage overflow, and construction on the beaches are the main factors that would negatively impact the surfer tourists' decision to return to Lobitos.

Lobitos is a perfect example of how a small village can benefit from, and depend on, the preservation of a world-class wave. As harmful coastal developments and inefficient sewage and solid waste management system threaten surfing and coastal resources in Lobitos, urgent action is needed to preserve this incredible surf ecosystem for future generations. As surf tourism is a non-extractive coastal resource that makes a significant contribution to the local economy of Lobitos, preserving this ecosystem will also leverage the benefits of the surf economy that could be shared with all the stakeholders in the village.

Lobitos Sunset from the Water Tower - Photo: Doug Harper - Source: EcoSwell's Photo Collection

Elliott at El Hueco - Photo: Hug

Fishermen of Lobitos – Photo: Jennifer Hazelton - Source: EcoSwell's Photo Collection



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Enviromental NGOs' Initiative - Photo: Anthony Rizzi - Source: EcoSwell's Photo Collection

EcoSwell Beach Cleanup in Lobitos - Photo: Mozart Tupinambá - Source: EcoSwell's Photo Collection

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Appendix I

Surfer Tourists Questionnaire

Surfonomics Lobitos, Peru
Surfer Tourists Questionnaire

1. Age: .....years old ( ) Male ( ) Female

2. Country of Origin (permanent country of residence): .....

3. Which factors best applies to your decision to visit Lobitos:
   ( ) Surfing and/or waves was a primary factor
   ( ) Surfing and/or waves was a contributing factor
   ( ) Surfing and/or waves did not effect my decision to live or visit Lobitos

4. How would you describe your surfing ability?
   ( ) Beginner ( ) Intermediate ( ) Advanced ( ) Pro

5. How many days do you intend to spend visiting Lobitos?..... days

6. How many people came with you to stay here in Lobitos?
   ( ) only myself ( ).....people

7. Please estimate your daily expenses in Lobitos:
   Accommodation $..... Food & Beverage $.....
   Surf-related Expenses $..... Miscellaneous $.....

8. Which environmental issue in Lobitos is the most noticeable to you and would negatively impact your decision to return here?
   ( ) Oil rigs/pump sites ( ) Solid waste/trash ( ) Construction ~~on the beaches~~
   ( ) Sewage overflow ( ) Deforestation ( ) Other Issues:

9. Your highest level of education:
   ( ) Some High School ( ) High School Diploma ( ) Some College/University
   ( ) University Degree ( ) Master Degree ( ) Doctorate Degree

Appendix II
Lodging Manager Questionnaire

Surfonomics Study: Lobitos, Peru
Lodging Managers Questionnaire

Name of the lodging business: .....

Number of guests that can be hosted in your establishment:.....guests

Number of tourists you hosted in 2019 :.....guests

Average occupancy rate in 2019 :.....%

Average lenght of stay in your establishment:.....days

Estimated percentage of surfer guests:.....%

Notes: .....

It all started with great friendships and a wonderful surf trip. Four lifelong friends (our co-founders) traveled along the Peruvian coast in search of waves. One of the locations they went to was the off-the-beaten-track town of Lobitos. Whilst there they caught some of the best waves of their lives, met some of the kindest people imaginable and were exposed to breath-taking natural beauty and wildlife. Jacques Cousteau once said: "people conserve what they love" and the group of friends had fallen for Lobitos. Seeing the environmental and social constraints the town was enduring though, contrasting with its natural beauty of the locality, made them realize that if nothing was done Lobitos' essence would not be a lasting one. EcoSwell is the manifestation of this call to action.

There was lack of clean water, the sewer system was broken and sewage spills had sprung up all over the town, there was huge degradation of the dry forest ecosystem, the fishing community did not have a relevant role in the growing tourism industry and none of the local stakeholders communicated or shared a common vision. We realized that as a group of young professionals from diverse backgrounds and with a true passion, we could really make a difference in organizing and guiding the development of Lobitos so we started to plan out our next steps.

Since then we have forged very strong ties within the community, we have developed over 19 projects covering most of the UN's Sustainable Development Goals and have improved the lives of over 5,500 people in Lobitos, in Piedritas and the nearby main city of Talara. Furthermore we have restored large patches of Dry Forest by planting thousands of trees and continue to influence the community towards a more sustainable way of life that makes both people and ecosystem thrive together.

The EcoSwell Family has grown to over 30 professionals from various nationalities, careers and backgrounds working together to try to make a positive impact in the lives of vulnerable coastal communities in Peru. We have teams in Peru and the UK and work with over 25 inspiring and value driven partners to enhance our ability to generate a long lasting and meaningful impact. Amazing to think that this is only the beginning of our story...there is so much more to come in the future and we are excited for anyone who wishes to be a part of it!

To learn more, please visit: **www.ecoswell.org**

Surf and Sustainability Research Group (SandS) is the first interdisciplinary research group in Brazil, certified by the Brazilian National Council for Scientific and Technological Development (CNPq), that studies the challenges and opportunities for a transition towards sustainability in the surfing world. SandS was created in 2017 at the Federal University of Santa Catarina (UFSC), Florianópolis Island, and aims to encourage collaboration between scholars from Brazil and abroad in studies relating to surf and sustainability. SandS works in collaboration with the International Association of Surfing Academics (IASA) led by the Center for Surf Research, San Diego State University, California.

To learn more, please visit: **www.sands.ufsc.br**

Doing the Survey - Photo: Elliott Lang - Source: EcoSwell's Photo Collection

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