

case study

Are We Putting Our Favorite Destinations in Peril? A no longer lost city - Machu Picchu case study

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Introduction

Machu Picchu has developed to become a major source of revenue for Peru and an iconic archeological site. Machu Picchu was built by the Incas to become one of the most beautiful and luxurious cities of the Incan empire in the mid-1400s. After Machu Picchu was rediscovered by Hiram Bingham in 1911 and featured in National Geographic, tourists became increasingly interested in this ancient Incan site, so they started to travel to Peru and see the city for themselves. In 1984, the United Nations Educational, Scientific and Cultural Organization (UNESCO) named Machu Picchu a World Heritage Site. From this label, Machu Picchu became well-known to the public, increasing the site's interest and tourism drastically. Then after being labeled one of the New Seven Wonders of the World in 2007, an increasing number of tourists started to arrive and explore Machu Picchu.

The tourism of Machu Picchu has become a major source of income for the Peruvian government. However, Machu Picchu's popularity has created a large surge of overtourism that has made a lasting negative impact on Machu Picchu's environment. Overtourism in Machu Picchu has caused the natural environment and ruins to be degraded by tourists and the sacred city to be disrespected. For example, many tourists have vandalized the ruins, polluted the area with garbage, and explored areas that were out of their guided boundaries. Machu Picchu is facing a significant overtourism dilemma, which needs to be resolved before there is nothing left to protect.

The distasteful actions and overpopulation of tourists have permanently and negatively affected Machu Picchu. The Peruvian government needs to implement a plan to protect this site. Because it is one of the New Seven Wonders of the World, UNESCO has tried to take steps to protect what is left of Machu Picchu while protecting the ruins and respecting the sacredness of the site in order to prevent erosion of the mountainside. Even though the Peruvian government recognizes the issue of over tourism, it has continued to allow millions of tourists to explore this site. UNESCO threatened the Peruvian government to enforce regulations; otherwise, it will be placed on their endangered list, in which case tourism would be discontinued and the site shut down. Since this threat, there have been several initiatives to implement better ways to maintain the balance of profit and preserve

Image Set 1



*Examples of graffiti on Machu Picchu

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the ancient city. Initiatives include restricting the number of tourists to visit Machu Picchu in certain time frames throughout the day. For example, ticket sales are divided into two different sections: morning (6 am – 12 pm) and afternoon (12:30 pm – 5:30 pm). This restriction is to manage the tourist flow and hopefully keep the ruins better preserved.

Background

“Machu Picchu is a Quechua word that comes from “Machu,” which means old or ancient, and “Picchu,” meaning mountain. Therefore, Machu Picchu translates as “Old Mountain.” (Machu Picchu History, 2019). Machu Picchu, a 15th-century Incan site, is located on a ridge between the Huayna Picchu and Machu Picchu mountains in Peru, at about 8,000 feet above sea level, on the east side of the Andes Mountains and overlooking the Urubamba River. Pachacuti Inca Yupanqui, the ninth ruler of the Incas, supposedly built Machu Picchu in the mid-1400s. Most believe Machu Picchu was used as a place of worship or astronomical observation, due to the elevation of the mountains. Others believe Inca Pachacuti used Machu Picchu as a luxury mausoleum for himself, his family, and other high socially ranked Incans.

All Incan sites, complexes, monuments, and citadels are intertwined with one another. The Incans also made all of their infrastructures and buildings without machinery or tools to help construct. Using manual labor, “they constructed more than 600 terraces to prevent the city from sliding down the mountain” (The Lost City of Machu Picchu, 2019). The Incans highly valued architecture, with their temple being oriented to catch the rays of the rising sun, and the slopes reflecting Huayna Picchu, the mountain behind Machu Picchu. All of these combinations have made Machu Picchu a cultural and sacred site. In 1572, the fall of the last Incan capital occurred, and Machu Picchu did not survive this collapse. The Inca’s line of rulers came to an end, and Machu Picchu fell into ruin.

In 1911, Yale professor and explorer Hiram Bingham III, while seeking the lost capitol city of the Incas, was brought to Machu Picchu by a local guide. When rediscovered by Bingham, Machu Picchu was overgrown with vegetation, completely untouched. This was an important fact because it meant that the Spanish never penetrated this ancient city, leaving intact the indications of the Inca’s civilization. All of the buildings of Machu Picchu were created without mortar, which was typical of construction methods that Incans used. After Bingham’s initial discovery of Machu Picchu, he immediately contacted Yale University, National Geographic, and the Peruvian government to gain donations to further his studies. From 1912 to 1915, a thorough survey of Machu Picchu commenced. The National Geographic magazine created a detailed article about the development and research of Machu

Picchu and the Incan civilization. This article was the first public appearance of Machu Picchu to an international audience. The audience was informed about this discovery, marking the beginning of tourism in Machu Picchu. Ever since this discovery, millions of tourists have traveled from across the world to see the ancient ruins of the city.

Case Dilemma

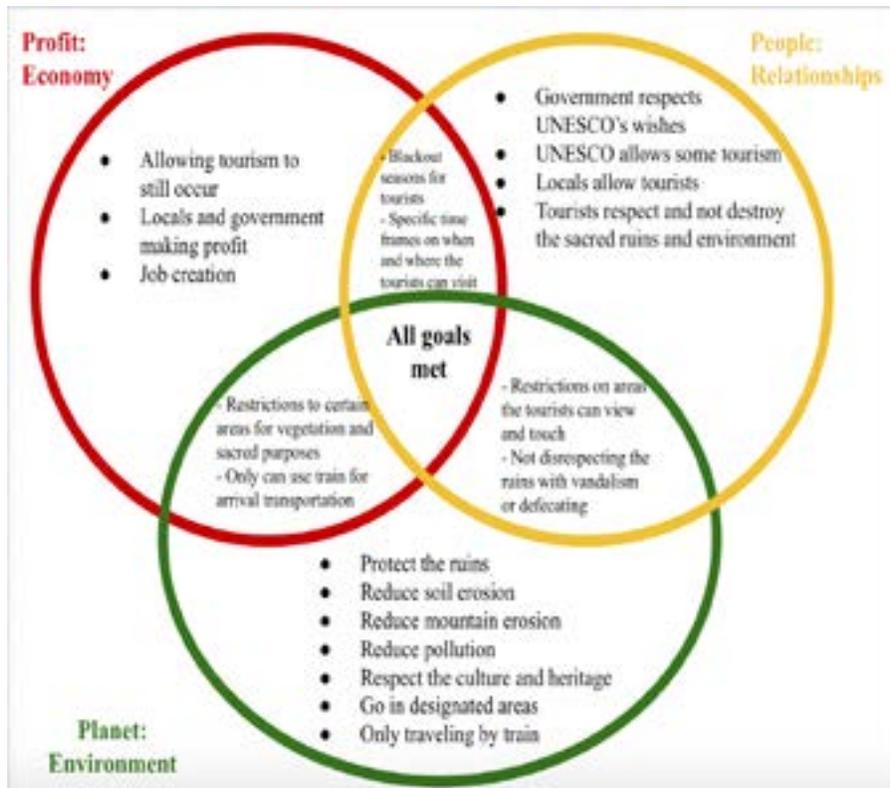
To expand on the concept of overtourism, we first must define this clunky word. This word describes a visitor influx that overwhelms local conditions. The overtourism of many popular tourist attractions such as Machu Picchu is driven directly by economic benefits. The economy is booming, while the environment is suffering. A simple question that needs to be asked is, “Are we loving our favorite places to death?”

We believe that overtourism is responsible for the negative impact made on the environment at sites like Machu Picchu. There is a direct correspondence between the positive effects of tourism on the economy and damage to the site. The country of Peru relies heavily on tourists spending their money on souvenirs and excursions to its popular archaeological and cultural sites. Unfortunately, the positive financial effects of overtourism are threatened by lack of limitations and restrictions on the environment, specifically the surrounding trails, transportation, and the historical grounds of Machu Picchu itself. Without plans in place to preserve and protect this valuable site, there quite literally may not be a place to visit soon, causing Peru to endure unacceptable and lasting repercussions.

The lasting damage to Machu Picchu has resulted from unbridled demands in visiting hours and transportation to and from the site. The trails that lead up to the site are in disarray as thousands of tourists trample through the native vegetation on their trek to the site. One article expressed the concern a researcher had when visiting the site and local souvenir shops. A tour guide told him a story about how sacred butterflies were to the Incas and how it was a good luck symbol. Later on, as he was visiting souvenir shops, he noticed butterfly wing clippings from butterflies caught on the peaks of the mountain for sale to tourists. This form of disrespect to the environment and culture is greedy and cruel. The value of the ancient civilization and the wildlife that encompasses the surrounding environment is priceless in comparison to capitalizing on tourism through the sale of souvenirs.

Figure 1

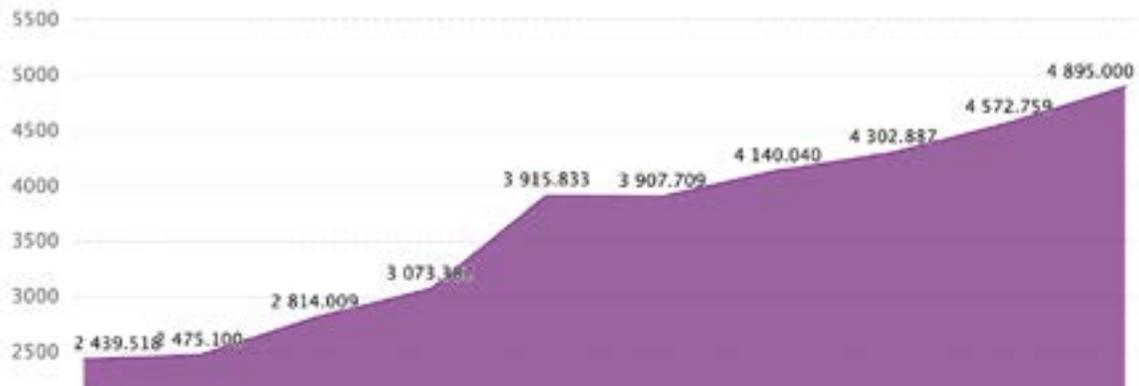
Triple Bottom Line Model Showing Interconnected Goals in the Spheres of People, Profits, and Planet



Source: Infographic created by the authors (2020)

Figure 2

Peru Tourism Revenue



Source: www.CEICDATA.com (2020)

Modeling the Solution

Effective solutions for saving Machu Picchu while preserving its economic benefits to the Peruvian people need to consider interrelated human, economic, and environmental factors. A model presented here shows overlapping spheres of People, Profit, and Planet and goals that can be considered in working toward viable solutions. Figure 1 shows the differences and relationships between the People, Profit, and Planet. It also shows the similarities that each sphere of concern shares with the others, to implement a solution. This is also known as the Triple Bottom Line.

People: The relationship between Peruvian natives and tourists has created a division amongst cultures. Natives consider travel to this site as a pilgrimage for paying respects to their ancestral ruler. Many roads lead to Machu Picchu, with the most important one being named the Inca Trail. The history of these trails remains the second sacred reason for natives to visit the site. The site itself represents the peak power of the Incan ruler Pachacuti, who is still highly esteemed by the native population. The tension between tourists and natives is increasing as the land continues to be trampled and destroyed. Resolutions to solve this specific dilemma appear nonexistent.

Profit: One of the main dilemmas that Peru has encountered is the profit they have been able to accumulate through tourism. Tourism in Peru has a significant positive effect economically. Figure 2 shows the annual tourism revenue throughout the decade. Additionally, 36,000 jobs were created in or around popular tourist destinations, contributing \$16 cx5 million in wages and direct income to households. Considering this as the primary source of revenue that local businesses can generate a living from, it seems nearly impossible to turn away visitors who are eager to spend their money on souvenirs and lodging expenses. Many natives in the surrounding areas have even picked up their entire lives to move to Machu Picchu to serve the tourists so they can earn an income and provide for themselves and their families. This relocation of Peruvians not only contributes to overtourism, but also has led to overpopulation in an area that is not able to sustain this growth.

Planet: Tourists from all over the world come to visit Machu Picchu to explore the ancient ruins. Looking at the dilemmas that are impacting Machu Picchu allows for a better understanding of how to fix the negative social, economic, and environmental impacts overtourism has on the historic site. In recent years there has been an influx of tourists visiting this site, which has caused irreparable damage. Tourists want to come to see Machu Picchu for the rich history captured in the hidden cliffs of Peru. The Peruvian government is aware of the current condition and is searching for ways to fix this land that holds so much history. Machu Picchu receives around 1,578,030 visitors a year. In recent years the government has recognized the limited capacity of the site to tolerate visitors and has limited the number of buses that are allowed to transport tourists up the mountain.

The Peruvian government has faced a long history of vandalism to ancient Incan sites. In January of 2020, four men and two women from Argentina, Chile, Brazil, and France were caught around six o'clock in the morning at the famous Incan sanctuary, Machu Picchu. The tourists decided to destroy parts of the already scarce ruins by spray painting and kicking down rock formations. This form of vandalism is irreparable, and archaeologists struggle to remove the paint that was used as a form of graffiti. A series of proposals have been put into place as of last year to protect this site, which includes placing cable cars and tunnel access from the valley up to the site, along with limiting access to specific hours a day. However, vandalism from the public continues to destroy this site. In response, the government is taking actions to jail and deport individuals who purposefully harm the site. The government has already established specific hours tourists can visit, which will go into effect as of June 2020.

Reccomendation/ Potential Implementation

We have created a list of recommended actions to help preserve the land, economy, and environment of Machu Picchu. Unfortunately, the site faces immediate threats of overtourism, which is a leading cause of environmental destruction. We know that the issue of overtourism must be addressed to preserve Machu Picchu's place as one of the greatest sites in history. As the number of tourists has increased, the number of alterations must increase to keep up with the demand or possibly curb the demand. It is essential to make changes to the way Machu Picchu operates now, in hope of keeping the destination off of the endangered list by UNESCO. Figure 1 lists all of our recommendations.

Transportation

Our recommendations have a broad range in variety to reflect the many perspectives of the Peruvian government. Firstly, the effect that transportation has on tourism in a destination is substantial. The most well-known effects of transportation on the environment are carbon dioxide emissions and pollution in the air. Not only does the use of transportation have these effects on the air, but it also contributes to global warming and climate change. To restrict the number of vehicles having these long-term effects on the environment, we recommend that the Peruvian government only allow tourists to travel to Machu Picchu by train. It will benefit the Peruvian locals to make a profit off of the train tickets as well as boosting Peru's economy. This will also help the environment by receiving fewer emissions and pollutants from automobiles. The use of trains allows for the most passengers with the least amount of toxins put into the environment. Studies show that, on average, "trains are four times more fuel-efficient than trucks" (Association of American Railroads, 2020). Also, the use of trains helps lower greenhouse gas emissions and emissions of particulate matter and nitrogen oxides. The use of trains rather than automobiles, will benefit Machu Picchu visitors and residents of Peru by having cleaner air, with

less traffic, and less contribution to global warming.

Restrictions

Although tourism can be a great source of revenue and build cultural awareness for a given country, along with it comes tourists, some of which behave in uncivil and disrespectful ways to the land. There are unfortunately recurring incidents regarding tourists damaging and disrespecting the site at Machu Picchu. To help reduce the number of these incidents, we recommend placing more restrictions, such as hiring more guards around specific areas. The end goal with these restrictions is to do a better job of protecting and preserving the sacred ruins. The way to restrict tourists from damaging vegetation in the area could be to close off certain areas of the site with more than just simple signage or tape. The government can restrict the tourists from venturing off authorized pathways by closing off specific trails that lead up to Machu Picchu. The trails closed off then can be restored and their native vegetation replenished. Therefore, throughout the peak seasons, the government can change which trails are used every couple of months to reduce the amount of soil erosion in the area as well as having more control over the crowd surplus. Tourists feeling the added pressure of guards would undoubtedly reduce the amount of damage to Machu Picchu.

Visiting Hours

Another simple recommendation to the problem of overtourism is to place restrictions on visiting hours and seasons. We feel that setting this restriction will allow for the site to be restored during off-peak seasons. It is imperative that the site has time to be restored and have time to cultivate naturally. Not only is it essential for Machu Picchu's environment to take this time off, but it is just as crucial for Peru's residents. There is much frustration coming from the residents as tourists are visiting all year round and affecting the environment. We believe it is vital for the health and well-being of the residents to have plenty of time off from tourists invading their space. Also, if visiting hours each day are reduced, revenue coming in from the tourists can be balanced with giving the environment enough time to settle and be well-kept by natives. A possible effect of restricting visiting hours would be an increase in the price of admission for tourists as well as a limited number of seats (on the train as previously mentioned). This adjustment would allow Peru's revenue to be maximized and still benefit the economy while putting less strain on Machu Picchu's environment.

Blackout Dates

A final recommendation to the Peruvian government in hopes of decreasing overtourism in Machu Picchu is to set black-out dates for tourists. A black-out date is when something is unavailable or out of order for the time being. This means no one would be able to visit Machu Picchu, and it would be completely closed off to the public. We feel that this will benefit the economy and environment because it will force visitors to adhere to the rules of when they are allowed and when not allowed on the site. This will help drive the economy as the government should control these black-out dates to their own benefit. Along with supporting the economy, black-out dates allow for the environment to be maintained by natives of the area, as previously mentioned.

Conclusion

Tourists need to be more aware of their actions and how they negatively impact popular sites such as Machu Picchu. Machu Picchu has undergone significant environmental damage to the landscape and the ruins by people's footsteps, garbage, and heinous actions such as vandalism, defecating, and ignorance. The Peruvian government also has taken part in the destruction of Machu Picchu by allowing a surplus of tourists to venture onto the site as well as allowing commercial development in the area such as restaurants, shops, and hotels. The actions from the tourists and the Peruvian government have caused a divide between the locals, government, UNESCO, and tourists. UNESCO is still trying to prevent the destruction of Machu Picchu, a World Heritage Site, only with the compliance and help from the government. However, with the recommendations provided, Machu Picchu should be able to regain the vegetation and beauty it once had and still maintain its booming tourist attraction. The Peruvian government still expects Machu Picchu to remain a significant tourist destination, while respecting the Incan culture and the ancient city ruins.

References

- Association of American Railroads. (2020). Environmental benefits of moving freight by rail. Retrieved February 10, 2020, from <https://www.aar.org/data/environmental-benefits-moving-freight-rail/>.
- Barcelona Field Study Centre. (2000). Machu Picchu: impact of tourism. Retrieved February 7, 2020, from <https://geographyfieldwork.com/MachuTourismImpact.htm>.
- Collins, D. (2019, May 15). "It would destroy it": New international airport for Machu Picchu sparks outrage. Retrieved March 23, 2020, from <https://www.theguardian.com/cities/2019/may/15/archaeologists-outraged-over-plans-for-machu-picchu-airport-chincho>.
- Connelly, C. (2017, May 31). "Lost City" no more, Machu Picchu feels the strain of booming tourism. *Chicago Tribune*. Retrieved February 12, 2020, from <https://www.chicagotribune.com/travel/ct-machu-picchu-tourism-boom-dangers-travel-0611-20170526-story.html>.
- Dangerfield, W. (2007, April 30). Saving Machu Picchu. *Smithsonian Magazine*. Retrieved February 12, 2020, from <https://www.smithsonianmag.com/travel/saving-machu-picchu-153497816/>.
- Deutsche W. (2019, November 5). Peru restricts access to Machu Picchu Inca city to prevent damage. Retrieved February 5, 2020, from <https://www.dw.com/en/peru-restricts-access-to-machu-picchu-inca-city-to-prevent-damage/a-48700956>.
- Deutsche W. (2020, January 15). Peru: Tourists accused of damaging, defecating on Machu Picchu. Retrieved February 12, 2020, from <https://www.dw.com/en/peru-tourists-accused-of-damaging-defecating-on-machu-picchu/a-52007055>.
- Globetrotter, L. (2019, January 02). Machu Picchu's popularity has sustained a culture. Retrieved February 12, 2020, from <https://www.libertytravel.com/travel-articles/machu-picchu-popularity-has-sustained-a-culture>.
- Groundwater, B. (2019, May 21). Machu Picchu: A world wonder is about to change forever. Retrieved February 12, 2020, from <https://www.stuff.co.nz/travel/news/112876155/machu-picchu-a-world-wonder-is-about-to-change-forever>.
- Jarus, O. (2012, August 31). Machu Picchu: Facts & history. Retrieved February 12, 2020, from <https://www.livescience.com/22869-machu-picchu.html>.
- Matlow, N. (2019, September 27). In the golden age of Tourism. How are you going to travel to Peru? Retrieved February 12, 2020, from <https://beunsettled.co/blog/overtourism-peru/>.
- Minihane, J. (2019, July 02). Destination trouble: Can overtourism be stopped in its tracks? Retrieved February 12, 2020, from <https://www.cnn.com/travel/article/how-to-stop-overtourism/index.html>.
- Moss, T. (2018, October 24). No, we're not trampling Machu Picchu out of existence. *Condé Nast Traveler*. Retrieved February 12, 2020, from <https://www.cntraveler.com/story/we-are-not-trampling-machu-picchu-out-of-existence>.
- Peru For Less. (2019). Why is Machu Picchu important? Retrieved February 2, 2020, from https://www.machupicchu.org/why_is_machu_picchu_important.htm.
- Ryley. (2018, February 1). Machu Picchu – Overtourism Report (Rep.). Retrieved February 12, 2020, from <https://overtourism.com/machu-picchu-overtourism-report/>.
- Taylor, D. B., & Yuhas, A. (2020, January 15). Peru deports five tourists accused of damaging Machu Picchu temple. Retrieved March 23, 2020, from <https://www.nytimes.com/2020/01/15/world/americas/machu-picchu-tourist-arrests.html>.
- Traveller, C. (2017, May 31). Peru's government introduces new travel rules to protect Machu Picchu. Canadian Traveller. Retrieved February 12, 2020, from <https://www.canadiantraveller.com/Perus-Government-Introduces-New-Travel-Rules-to-Protect-Machu-Picchu>.
- West, K. (2019, August 12). The consequences of overtourism in Machu Picchu. Retrieved from <https://www.departures.com/travel/consequences-of-overtourism-machu-picchu>.
- Whitman, M. (2018, September 5). Machu Picchu environmental concerns abate. Retrieved February 8, 2020, from <https://www.machupicchutrek.net/machu-picchu-environmental-concerns/>.
- Whitman, M. (2019, June 19). How many tourists visit Machu Picchu annually? Retrieved February 12, 2020, from <https://www.machupicchutrek.net/how-many-tourists-visit-machu-picchu-annually/>.