

Hammerman Scholarship 2022

Kimberley Murray

In the summer of 2022, I was fortunate enough to receive the Hammerman award, allowing me to travel to Peru and complete an Internship with EcoSwell. [EcoSwell](#) is an NGO based in Lobitos, a small fishing village on the Northwest coast of Peru which aims to help developing communities achieve the United Nations sustainable development goals. After learning about the incredible work EcoSwell does during an [Engineers Without Borders](#) (EWB) project I undertook at university, I became very interested in joining such a positive movement. Therefore, with thanks to the award, I joined EcoSwell for two weeks as part of the Renewable Energy team as it is an aspect of engineering which I am particularly passionate about.



Lobitos, Peru

Since 2013 EcoSwell has been both designing and developing socio-environmental, educational and infrastructure projects with the developing community to help drive sustainable development. Lead by the four directors; Andres Bustamante, Diego Almendrades, Michael Alderson and Alejandro Pizarro, EcoSwell focuses on working with the community which means that all their projects are genuinely important for Lobitos.

EcoSwell Project Experiences

After flying to Talara, the nearest city to Lobitos, I was brought to the EcoSwell house where I would be living and working for the next two weeks. After a warm welcome I began learning more about EcoSwell's aims, culture and the ongoing projects. Although there were many interesting projects in the different areas: Reforestation and Ecosystem Restoration, Water and Sanitation, and Public Health; I joined 3 of the Renewable energy projects.

Energy Audit Project

A significant number of people in Lobitos have no access to electricity in their own homes. For many this is due to the high cost of electricity and in establishing the grid connection which results in families relying on candlelight and unclean cooking methods. With sustainability at the forefront of every decision, EcoSwell were looking to provide cheaper solar powered solutions for the families whilst helping them understand how to keep their electricity consumption as economical as possible. Eventually, EcoSwell would like to be able to offer a suitable solution for each family in a straightforward, clear, and replicable manner.



EcoSwell installing our chosen solar panels after I left

Therefore, I became part of the team creating an Energy Audit Framework to help future interns and employees follow a proven guide and procedure. The system of documents and spreadsheets we created outline the procedure required to assess the electrical needs of a local family and provide an appropriate solar solution after a simple survey. Additionally, I created a spreadsheet which uses a breakdown of the local electricity provider's tariffs and the initial appliance survey to show families who are already grid connected easy ways to reduce their bills.

I found this project extremely engaging as it allowed me to use my knowledge of solar PV solutions and demand side management strategies to create the spreadsheets and find the best solution for the families. I also had to ensure the solution was of the appropriate scale for the developing community in respect to cost, material selection and the site-specific challenges i.e, the roofs providing insufficient support for some solar panels.

To ensure the framework was effective, we used it to propose a solution for a member of staff's house. Since leaving EcoSwell, I was extremely excited to hear that this has now been installed and they have access to electricity in their home for the first time. Although only a small part of this project – this incredibly exciting and rewarding work has fueled my drive to continue using my engineering skills to make a difference to people's lives.



Meche using electricity in her home for the first time

Solar Powered Lighting for the Fishermen's Pier

The next project I worked on was helping the Fisherman's Association create a proposal to get funding for solar powered lighting on the pier. Fishing is the main source of income for the people of Lobitos and most of these fisherman dock and unload their boats at the pier. However, this becomes dangerous in the dark, especially when the steps are often slippery. Therefore, I joined the team proposing the most economical array of solar powered lights. My highlight of the project was when we got to propose the solution to the fisherman and receive their feedback to finalise the proposal.



View of the Fishermen's Pier



George, Maxime and I building community benches during a weekly planting morning

Solar Distiller Project

The final project I was able to join was the Solar Distiller Project. Lobitos faces huge water scarcity issues due to extremely low amounts of rainfall and significant challenges (both geographically and economically) faced when transporting clean water from other regions. Additionally, when El Nino events occur, landslides and other storm damages can result in the town being cut off for weeks at a time.

This is why the solar distiller project has so much potential, as it allows salt water (which Lobitos has plenty of) to be made into clean, drinking water. The first prototype had been built; however, the yield still had to be improved. After leaks in the collection tray were noticed, a new funnel was designed which was then the welder. Once the welder had fixed it to the distiller (a meeting which really tested my Spanish and



The final prototype of the solar distiller I was working on



Working on my projects outside to enjoy the warm weather

google translate skills) I conducted some tests which showed an improvement in the volume of drinking water collected.

As the testing and improving of the final prototype draws to an end, EcoSwell aim to scale up locally so every family can have access to clean drinking water.

In addition to obtaining the experience of working on these meaningful projects, I also must mention my leanings from the people I was working with. Due to the small team, I was often working closely with the directors who shared their passion for sustainability and holistic management styles whilst helping me implement the sustainable engineering practices I have learnt about throughout my studies.

Cultural Experience in Lobitos

Through living at EcoSwell, I got to experience first-hand both the challenges faced by the people of Lobitos as well as the incredibly friendly and positive community this place holds.

Lobitos is located very close to the equator and is classified as a 'hyper-arid' zone due to its extreme lack of rainfall. Although Peru is known to have significant levels of freshwater, it is only



Sewage Puddles

in regions at the other side of the country. This brings significant challenges when transporting the water over Andean terrain to the furthest possible geographical location. The true scarcity of this resource in Lobitos became apparent when we ran out of water twice due to the delivery delays.

Additionally, the sewage from Talara gets pumped towards the sea however, the pipes end in Lobitos and there were puddles of sewage next to the volleyball court and sometimes on the streets. There were also several power outages during my stay which is common in the area and often has very detrimental effects on the local hospital.

I think it was therefore extremely eye opening and important to see this first hand as it has helped me truly appreciate what we have in the UK as well as provide an even greater drive to help communities like this develop further.

With this said, I left Lobitos with a heavy heart. During my stay I was fortunate enough to experience the positive, creative and friendly community that is Lobitos.



Fishing and whale watching trip

On only my first full day, the fisherman took us out on their boat where I can proudly say I caught some fish which was then used to make the freshest Seviche I am sure I will ever eat. We were then joined by two Humpback whales – a sight I will never forget. Every day I saw a new part of the community; from painting with Junior – a local artist to horse riding along the beach to explore the beautiful caves. Every night the community came together for some live music, table tennis tournaments, beach clean-ups or Karaoke. As Lobitos is known for its incredible surfing, most nights I loved learning to surf under the setting sun. The nights I wasn't developing my newfound hobby, many people from town would join EcoSwell for some beach volleyball. Whilst I was out there, I also got to volunteer with 'Waves' which organises English, art, surfing and skateboarding lessons for the local children.

Therefore, not only was it the inspirational and important work of EcoSwell which made this trip so special but also the positive and welcoming community.



Horse riding along the beach



Volleyball court and Junior's art gallery and studio in the back

Additional Travel



Machu Picchu

Whilst so far away from home, I had to take the opportunity to travel to the other regions of Peru. I spent one week traveling Cusco and parts of the Inka trail. Learning about the history of the Inkas was fascinating and I particularly loved trying the local delicacies.

An obvious highlight from this part of my travels was seeing my first wonder of the world – Machu Picchu.



Hike to Rainbow Mountain at 5200m above sea level



My tour group as we were hiking the Inka trail



Grinding coffee beans at a stop on the Inka trail

What I learnt and How It Will Help My Career

My time at EcoSwell has left me with a new-found passion and drive to use my engineering knowledge and skills to drive sustainable development, particularly in more under-developed communities. Additionally, through the three projects I became a part of, I have gained valuable experience working on professional projects in a very diverse team. I found the work extremely rewarding as I saw first hand how the projects actually make a difference to people's lives, and I know that this is something I would love to experience again. Through seeing the inner workings of an NGO and how the projects are planned and put into motion, I have learnt a lot about management styles and the importance of fully considering all the effects of any decision.

Throughout my travels I met many incredible people and had a lot of unforgettable experiences, so I would just like to thank everyone who made this trip of a lifetime possible.



Made lots of new friends whilst travelling

