Sustainable Building Blocks in the Himalayas

Before departure

I applied for the KTH Field Studies travel grant for the opportunity of an adventure that would allow me to apply my engineering skills in a real-world setting. The project, focused on creating eco-friendly bricks in Nepal, fit perfectly as a bachelor's thesis and combined my interest in societal impact and sustainable engineering. The project itself was listed on the KTH Field Studies website, and it immediately caught my eye because of its relevance to my field of study and its potential impact.

Choosing Nepal was an exciting decision. I'd never been there before, but the country's rich culture and stunning landscapes made it a fascinating destination. Preparing for the trip was straightforward. I didn't take any language courses but bought a translation book once I arrived. I got a few necessary vaccinations and opted for a visa on arrival, which I obtained at the Kathmandu airport (a tip for future travelers: bring cash for the visa fee). It felt reassuring to know I was going to an organization with which I had much contact before my departure, both about my project and practicalities, and that I had the support of Engineers Without Borders and KTH.

Upon arrival

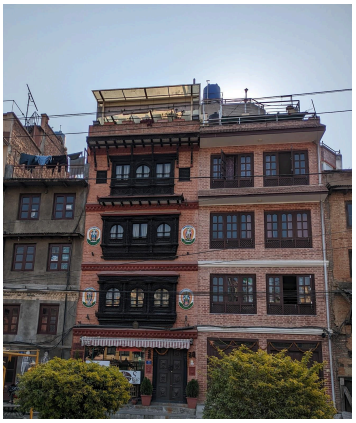
I arrived in Kathmandu right at the start of my project, and from day one, I was thrown right into the action. Raine Isaksson from Engineers Without Borders (EWB) was there to help me get introduced to the project, making my first days much smoother. Ashish Maharjan, the R&D head at Build Up Nepal, was incredibly helpful, ensuring I was well-oriented and settled. He arranged my accommodation, got me a local SIM card, and introduced me to both the workplace and the local culture.

Just two days after arriving, we embarked on our first field trip, giving me an immediate hands-on experience. After that, I started doing experiments right away, initially with Ashish's guidance, but soon I was responsible for planning and executing the work, with valuable help from Manoj and Saroj in the workshop. The quick immersion and support from the team made the experience both thrilling and rewarding. For anyone considering a similar adventure, I highly recommend diving in headfirst—you'll learn so much and have an amazing time!

Financials

Financially, my field study in Nepal was much less expensive than living in Sweden. The cost of living is significantly lower, especially when it comes to food. Eating out was incredibly cheap—most meals at local restaurants cost between 10-30 SEK. I found that eating at local spots, where momos (Nepalese dumplings) and fried rice are delicious and affordable, was a great way to save money. Cooking at home wasn't really worth it given the low cost and amazing variety of local cuisine. Some imported goods, like coffee, were more expensive and had prices comparable to Swedish ones. My accommodation cost around 4500 SEK per month, which is quite pricey by Nepali standards, but it was for a good apartment in a great location close to the historical Patan Durbar Square.

Accommodation



Finding accommodation in Kathmandu was made easy with the help of Ashish Maharjan from Build Up Nepal. He arranged a great place for me located near Patan Durbar Square, a historically and culturally significant site. The apartment was in the heart of Patan, close to many restaurants and shops, making it convenient to explore and enjoy local life. The area felt safe and I could walk around alone, even a bit after dark.

My apartment was about a 30-minute walk from the office, which was a nice daily routine, though crossing a busy road with its high traffic volume could be a bit daunting (even if the vehicles drive pretty slowly). The apartment itself was quite clean and had everything I needed: a bedroom, kitchen, and bathroom. It cost around 4500 SEK per month, which is relatively expensive for Nepal, but considering its location and quality, it was well worth it. Having my own space made my stay comfortable and safe.

Project

My project in Nepal focused on developing eco-friendly bricks with the goal of reducing cement usage while maintaining strength. Cement production is a significant source of CO_2 emissions, so this initiative supports sustainable construction practices and aligns with the UN's Sustainable Development Goals. Additionally, cement is expensive, making it beneficial to reduce its use, especially in a developing country like Nepal.

A typical day during my field studies, I spent most of the day in the workshop with Saroj, Manoj, and Ashish. We conducted numerous tests, creating and breaking blocks made from various mixtures. These experiments were crucial in understanding the properties of different brick compositions. Early on, we embarked on a field trip to a site near Kathmandu, and later, I visited Jajarkot, a more rural area. This visit was a highlight, offering a glimpse into the local way of life and providing an invaluable hands-on experience in evaluating and implementing improvements at five different sites. We actually made some implementations based on my results which was really cool!

Presenting my results to the engineering team and the CEO was an exciting opportunity, and I felt that the organization took my work seriously. Throughout the project, I received a lot of support from Ashish and Raine, as well as my KTH supervisor Mårten Olsson, which was helpful when navigating the challenges and achieving the project's goals. The experience has inspired me to continue working in sustainable engineering, with hopes of furthering this project's impact. We are currently writing another paper on the topic of bulk density which was a central part of my work and I hope to continue collaborating with Engineers Without Borders in the future.

Country

Nepal is a vibrant and culturally rich country that really impressed me. The landscapes, from the busy, narrow streets of Kathmandu to the grand Himalayan mountain range, were stunning. The cultural heritage and religious life is deeply woven into everyday life, with historic temples in every corner.

I did experience some culture shock initially, especially with the hectic traffic and different pace of life. The streets are filled with motorcycles and cars navigating seemingly chaotic roads, but it all works somehow in an intriguing and efficient way. Dogs are all over the city and are sometimes lying in the streets but they still are not run over by the cars. The smoggy air in Kathmandu was a bit rough, but after rain it cleared out and a few days during my stay we could even see the Himalayas from the office terrace.

The people of Nepal were warm and welcoming, which made my adjustment much easier. Sharing meals, celebrating local festivals like Holi, and learning Nepali in the workshop was a fantastic way to truly experience Nepal. I definitely want to go back.

Leisure and social activities

My colleagues in Nepal were incredibly welcoming, making it easy to enjoy my spare time. Before the trip, I expected to spend most of my free time alone, but that was far from the case as my colleagues often included me in their plans. I had the chance to go hiking in the mountains, which offered breathtaking views and a sense of adventure. Visiting temples around Kathmandu provided a different cultural experience, and trying local foods like momos and eating dal bhat with my hands was always a treat.

I also enjoyed the vibrant nightlife in Thamel, attended concerts, and explored both outdoor and indoor climbing spots in my free time. After work, we often had chiya (tea) sessions, which were a relaxing way to unwind and socialize.

During our trip to Jajarkot, we engaged in a variety of activities that brought us closer as a team. We cooked together, played badminton, swam in the river, and rode motorcycles through the stunning

landscape with the river winding among the mountains. Overall, it was fantastic and it was hard coming back home to normal life after everything I got to experience.

Sustainability

Sustainability was a key focus during my field studies in Nepal. Although I had to fly to get there due to the distance, I made a conscious effort to minimize my carbon footprint once I arrived. I walked to work every day and generally relied on walking for most of my transportation needs, which not only reduced emissions but also allowed me to experience the local environment.

My project was directly connected to the Global Sustainable Development Goals, Goal 11: Sustainable Cities and Communities. By developing eco-friendly bricks with reduced cement usage, our work aimed to lower CO_2 emissions in construction. My results showed the potential for an annual CO_2 emission reduction equivalent to about 1,000 round trips by flight between Stockholm and Kathmandu. This significant impact highlights the importance of sustainable practices in construction and supports global efforts to combat climate change.

Other recommendations and observations

For a field trip in general I recommend to be open minded and try to experience as much as possible when given this opportunity. Learning some of the language was both practical and it seemed like they appreciated the effort, so I definitely recommend that.

A specific tip for Nepal is to download the Indrive and Pathao app for longer trips around town. It basically works like uber and is really cheap.

If you are thinking about applying, do it!