Sustainable Design in Malawi, Africa

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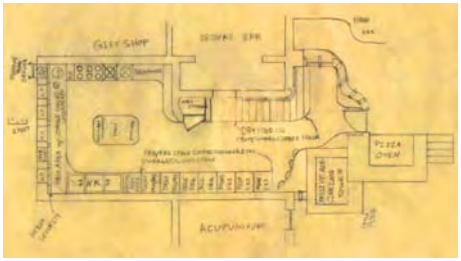
Work Abroad in Malawi

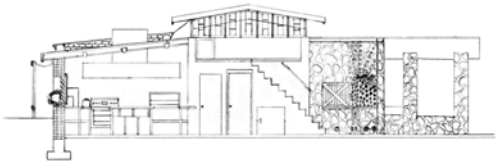
After being nominated to study abroad, I received funding from Peacework and the University of Arkansas Honor's College to go to Malawi, Africa to use my academic experiences and skills in humanitarian development. Not knowing what projects I might be doing until arriving on site, I set off for Blantyre, Malawi in June of 2015. Quite the entrepreneur and visionary, my host Chris Walker immediately tasked me with several projects. After a couple weeks of brainstorming on these projects, I narrowed my focus to two, both of which are featured in this presentation. In my first five weeks, I finished the final design for a sustainable restaurant kitchen for Chris' business Pa Nthunzi "the sustainability center". The kitchen was a necessity to supplement the finances to continue his business in permaculture training and landscaping. Chris sent me off to the rural area of Mulanje for my last five weeks to prepare a design for a demonstration permaculture garden that can be used as a community center to host training sessions on permaculture and spike the interest of rural communities in the benefits of permaculture design.

The Sustainable Restaurant Kitchen

This project began with obtaining a list of kitchen requirements from Chris Walker, and taking measurements of the site. After sketching a plan, I began researching precedents for kitchens both online and by visiting five different restaurant kitchens in the city. I learned about the different sort of appliances used and the difficulties other restaurants experienced in their kitchens. In the mean time, I began sketching out iterations of the plan and researching different sustainable technologies that I could incorporate in the design. I researched wind patterns, sunlight and humidity in Malawi to help choose the best strategies. At the end of five weeks, I presented Chris with a final plan that satisfied his requirements.

Restaurant Kitchen Plan and Section Drawings





Building Phase

The planning and design phases are just the beginning. Construction, funding and sourcing of materials were, at best, barely touched upon before I had to return to the United States. Currently, the sustainable restaurant kitchen is under construction.

The Demonstration Permaculture Garden and Community Center

Gathering data from the site and community stakeholders through meetings and surveys took up the majority of my time in Mulanje. For this project, I worked along side a permaculture specialist, Hiwa Namatica, who translated all the meetings I had with the members of the community. The final master plan includes: permaculture gardens, a multi-use facility (bookshop, student workshop, restaurant kitchen, indoor and outdoor dining areas, and a crop surplus shop), chicken and duck coops, a fish pond, composting toilets and bins, rainwater collection tanks and outdoor gathering spaces.

Limitations

With a cohort of community volunteers, I took measurements and recorded a list of the plants on the 180 foot by 150 foot parcel of land. Although the community would like to begin building, construction on the Demonstration Permaculture Garden has not begun due to funding constraints.

Incorporated Sustainable Systems in Design

-Passive air flow strategies (Passive air cooling tower, clerestory, PVC pipe airways and a pocket herb wall with recessed windows)

-Biogas tank, outdoor rocket stoves and solar panels for cooking and lighting

-Passive indirect lighting strategies (such as a light tube, recessed pocket windows, and a clerestory)

-Rain water collection and passive water transport strategy (water tanks in combination with the P.A.C.T. tower)

-Reuse of current structural framework of the kitchen (some of preexisting brick walls, clerestory windows and clerestory roof)

-Use of local environmentally-friendly materials for the construction of walls, work surfaces, lighting and aesthetics (bricks, recycled wine bottles and glass, and concrete material)

-Excess heat reduction strategies (arrangement of heat producing technology in the plan to allow for immediate release of excess heat into the exterior and arrangement of food cooling units to retain the greatest amount of energy possible)

-Arrangement of components in the plan for efficient use of human energy

-Public participation (through stakeholder inclusion from the beginning with surveys, group field work, and presentation of design alternatives to the community and nearby secondary school)

-Permaculture strategies (such as companion intercrop plantings of maize and beans, preservation of preexisting plants, keyhole irrigation for farming and a vegetable nursery)

Reflections

Studying abroad and designing architecture that is actually going to be built and affect people's lives presented many challenges that I had never faced before. In the process I gained valuable experience in how to plan, gather and lead a project for a large community of a different culture and language, as well as how to design for a client and present to diverse stakeholders. I now have not only the desire, but the knowledge to design the built environment more sustainably.

This poster was prepared in partial fulfillment of SUST 4103 Sustainability Capstone