

Pedal Power Empowering Rural Communities in Guatemala

Savannah College of Art and Design

Project Leader: Javier Chau Chang

Team Members: Emma Wosje, Alyx Price.

Other team member: Javier Meza (Universidad del Valle de Guatemala) Mid-

June to August 2022

Synopsis

Our project will bring self-sustaining electricity to communities located in Guatemala's Chimaltenango Department by constructing pedal-powered domestic appliances. By partnering with Maya Pedal, our team will design new "Bicimaquinas" (pedal-powered machines) concepts in response to our research collected from community outreach. Using locally sourced materials we will build Bicimaquinas to bring cost-efficient, self-sufficient, and sustainable solutions to local residents. Our hands-on team will be developing new design ideas, assisting with construction, supplying safety equipment and bike tools, and donating machines.

Our partner organization is Maya Pedal: Founder & CEO Mario Juarez

Background

In Guatemala, rural communities either don't have access or cannot afford electricity and plumbing. As a result, there is great economic disparity between residents in the cities and rural areas¹. These communities need clean water and new technology to support their livelihood and businesses, however, the cost to move or establish energy plants is simply too high². In 1997, Maya Pedal invented Bicimaquinas³, which are pedal-powered machines typically made from recycled bike parts and metal scraps, to address these disparities. After conducting anthropological research, they were able to develop their first machine, which focused on agricultural needs like corn milling and water pumping. These types of machines are still used today in the Chimaltenango Department, and many local residents have extended their original use into more fields. For example, one woman reused a pedal-powered blender to make shampoo to sell to community members and tourists⁴.

Today, Bicimaquinas are still needed, however, the supply cost has increased while outreach has decreased due to the ongoing COVID-19 pandemic. With funding, our team will campaign for bike donations and material suppliers to gain sustainable access to affordable, renewable construction material. We also will conduct anthropological research to answer modern problems with modern, culturally relative solutions. With the research collected, we will then build and donate new Bicimaquinas to the Chimaltenango Department.

As students of Savannah College of Art and Design and Universidad del Valle de Guatemala, we believe in the importance of generating innovative ideas that are environmentally conscious and have a positive impact on vulnerable communities. Being a team of two industrial designers, a chemist, and a performing arts major we foster these values in a diverse skill set. Javier Chau Chang and Emma Wosje will take the lead on ideation and prototyping, with their background in concept development and workshop knowledge. Javier Meza, being a chemistry student, can provide insights on harnessing various forms of renewable energy and STEM-centered critical analysis. Additionally, Alyx Price, a performing arts major, can encourage empathy and understanding for the people we are helping and provide the important community outreach piece to this project.

¹ Abbott, Jeff. "Guatemala Communities Rebel Against High Energy Costs." 15 August 2018. *nacla*.

<<https://nacla.org/news/2018/08/22/guatemala-communities-rebel-against-high-energy-costs>>.

² World Bank Group. *Guatemala's Water Supply, Sanitation, and Hygiene Poverty Diagnostic*. Washington DC: WASH Poverty Diagnostic, 2018.

³ Maya Pedal. *Maya Pedal Guatemala*. 2010. <<http://www.mayapedal.org/index>>.

⁴ Field Study of The World - Design, Engineering, Social Sustainability, Waste. "Pedal-powered bicycle machines of Maya Pedal." 10 April 2017. *Field Study of The World*. <<https://www.fieldstudyoftheworld.com/pedal-powered-bicycle-machines-maya-pedal/>>.

Goals and Objectives

After campaigning for resource donations and conducting our research, our objective is to develop and re-imagine machines to solve social inequalities in the Chimaltenango Department. With these Bicimaquinas, we aim to:

- Answer local needs, such as clean water, sanitization, and affordable agricultural machinery;
- Inspire continued and sustainable connections between donators and suppliers; and
- Create and support local jobs.

Project Timeline

April 1 - June 19, 2022, Concept Building, and Campaigning:

Ideation and fundraising begin amongst the team to prepare for the on-ground work.

June 20 - July 4, 2022, Research:

Commute between outreached communities in Chimaltenango Department and Maya Pedal headquarters in Guatemala City to ideate and conduct anthropological research through survey and participant observation.

July 4 - August 8, 2022, Construction:

Create and construct Bicimaquinas with volunteers and local residents.

Sustainability

- The project team will donate completed Bicimaquinas to rural communities.
- Maya Pedal will retain the intellectual rights to new Bicimaquinas designs.
- The project team will record In-depth tutorials for future educational purposes, which will be accessible in Maya Pedal's Website (provided in English and Spanish).
- Donated safety equipment and bike tools will have continued use after the conclusion of this project.
- The remaining budget fund will be donated to Maya Pedal.

Expected Outcomes

- Empower the community through self-sufficient energy that can assist and create jobs to stimulate their local economy.
- Establish lasting and professional relationships between Maya Pedal and donators in order to support the continued production of Bicimaquinas.

Name: Emma Wosje, Javier Chau Chang, Alyx Price, and Javier Meza					Note: all funds in US dollars.				
Project Name: Pedal Power Empowering Rural Communities in Guatemala									
School: Savannah College of Art and Design					TOTAL FUNDS REMAINING:				
					\$ -				
Projects for Peace grant:		\$ 10,000.00							
Estimated Additional Funding, if any:		\$ 2,500.00	GoFundMe & Campaign		TOTAL EXPENDITURES:				
Total funding available:		\$ 12,500.00			\$ 12,500.00				
Student Expenses					Project Expenses				
Travel (Including Airfare)	Lodging	Gas	Food	Miscellaneous	Non-Student Travel and Lodging	Direct Equipment, Supplies, and Bicimaquinas	Marketing and Event Support	Staffing Costs	Miscellaneous
\$400	1,700	200		300	N/A	6,000	600	2,000	500
\$400									
\$400									
Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
\$ 1,200.00	\$ 1,700.00	\$ 200.00	\$ -	\$ 300.00	\$ -	\$ 6,000.00	\$ 600.00	\$ 2,000.00	\$ 500.00
Total Student Expenses: \$ 3,400.00					Total Project Expenses: \$ 9,100.00				