

Maya Pedal's Bicimáquinas

The bicycle you left on the curb the last time you moved might be grinding corn or depulping coffee beans in Guatemala right now. Maya Pedal, a nongovernmental organization based in San Andrés Itzapa near the highlands of Guatemala's Mayan country, accepts crates of cast-off bikes from organizations in North America and transforms them into household appliances.

Maya Pedal's *bicidesgranadora/molino*, a combination corn sheller and corn flour mill, is the most popular *bicimáquina*, or bike-powered machine, to come out of their shop. Others include the *bicilicuada* (bike blender), *bicibomba* (pedal-powered water pump), *bicivibradora* (a bike-powered machine that vibrates the bubbles out of concrete as it forms roofing tiles), a *despulpadora* (coffee depulper), *bicimacademia* (macademia nut sheller), *biciesmeril* (metal tool sharpener), and a cargo bike. A *bicilavadora* (pedal-powered washing machine) designed by students at the Massachusetts Institute of Technology (MIT) is still in the prototype phase, as is a pedal-powered electrical generator.

Volunteers from around the world visit Maya Pedal and offer their time and skills, but the organization is sustained by just a few locals, including its chief inventor and mechanic Carlos Marroquin Machàn. Carlos, 38, was for a long time a rural farmer, like most of Guatemala's indigenous population. Then in 1997 he hooked up with the newly formed Maya Pedal and added "mechanic" to his resume. After 11 years of building *bicimáquinas*, Carlos excels at combining gears, custom flywheels, bike frames, angle iron, rebar, and traditionally hand-cranked or electrically powered devices to make the best use of human power. For example, in the popular *bicidesgranadora*, Carlos mounted a formerly hand-cranked corn sheller on an angle-iron frame and connected it to a pedal-driven chain drive, as

shown in Figure 2.6. Using pedal power, customers can shell corn three to four times faster than they could by hand.

Though it currently relies on donations for a portion of its budget, Maya Pedal aims to be entirely self-sufficient, funding its work through sales of refurbished bicycles. *Bicimáquinas*, of which an estimated two-thousand have been distributed during its 11-year existence, are sold at cost. A *bicilicuada* costs around US\$40, a *bicimolino* about US\$185, and a *bicivibradora* goes for about US\$250.⁴¹

Because the machines can cost as much as 2 months' pay, they are usually purchased by



Figure 2.6 Maya Pedal's *Bicidesgranadora* (Corn Sheller)

groups or collectives. In a land where approximately 80% of the population lives in poverty, bicimáquinas can empower people to make a better life. Doña Ana speaks on behalf of fifteen women who purchased a bicilicuada to establish a small business: “We decided to cut leaves of the local aloe and herbs, put some money into soaps, tags, and plastic bottles, and make shampoo. The blender creates a good liquid consistency and we didn’t need electricity, only our legs. Although it’s not easy to sell anything in the local market, at least we have a product which the fifteen women can produce and support our larger families.”⁴² Figure 2.7 shows one of Maya Pedal’s bicilicuardas, which, with its ingenious gearing, can spin the blender shaft at over 6,000 rpm.

Don Santiago, a young man whose family founded a business on making concrete roofing tiles with a bicivibradora, said, “These machines are a positive symbol that empowers one to make his own livelihood. The advance of technology is the hope that can make us self-sufficient.”⁴³

In addition, Maya Pedal customers and staff appreciate the fact that the bicimáquinas rely on recycled parts and renewable energy. Carlos told one MIT volunteer, “We’re burdened with the question of the natural environment, air pollution, water contamination.... I want to be a model for not just Central America, but I want North Americans to see that we can really live a rich life with less resources.”⁴⁴



Figure 2.7 Maya Pedal’s Bicilicuada (Blender)