

One Man's Trash: Garbage into Fuel in Kathmandu  
Nepal  
Bennington College  
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www.fuelcity.blogspot.com

The goal of my Davis Project for Peace was/is to promote the use of anaerobic digestion (AD, or “biogas”) technology as a means of managing municipal solid waste in Kathmandu, Nepal. Chiefly by helping various end users to install a total of five AD plants, with which they will be able to convert their organic waste into fuel, I have aimed to help alleviate resource management problems that lead to violence in the city. I used only Davis Projects for Peace funds for this project.

“One Man's Trash” has had both intangible and tangible effects. These have manifested respectively as a network of people who support the biogas installations I have facilitated, and the installations themselves. First I will detail the latter's comparatively quantifiable impact.

With an old drinking water tank plus the help of biogas researcher Jeeban Shrestha, NGO officer Bindu Manandhar, and sixty schoolchildren, I have built a twenty liter demonstration plant at the Bright Horizons Children's Home (BHCH), an orphanage and school. The principal of BHCH and students will fill and test their digester soon. I built another twenty liter plant at a cafe called Karma Coffee in order to test the biogas yield of coffee grounds. The Karma Coffee digester produced several liters of flammable gas about three weeks after its completion.

To witness the ignition of gas produced only by coffee, water and invisible microbes is an exciting thing – it combines the primal appeal of fire with an intimation of alchemy, lead into gold, which most of us still like also. The functional biogas digester becomes an expedient means of attracting attention and support, as well as an excellent conversation piece. I mentioned it in passing to a shopkeeper, and was happy to hear him immediately relate the concept in Nepali to some other customers. The Karma Coffee employees who saw the ignition with me now have proof of spent coffee's potential as a fuel source, and can confirm it for anyone who inquires.

Local supporters and I built an experimental 200 liter plant at the high elevation Jhule Mountain Resort, in order to test gas yield from kitchen waste in cool conditions. Temperatures at the Resort often dip as low as ten degrees C at night, or even zero in the winter. The task of heating the interior of the Jhule digester gave me the opportunity bring together a diverse sampling of local talent, including all of the Resort's employees, Jeeban Shrestha and Jason Shah, co-founder of the not-for-profit Open Biotechture. Together we insulated the digester with “cob”, a clay compound similar to adobe, and built a greenhouse around it. I knew how to do neither of these things, but my collaborators taught me how. The ideal temperature for biogas production is about thirty-seven degrees C (the same temperature as a healthy human body), but may still occur at temperatures as low as about twenty. The Jhule digester has not produced gas as of the 4<sup>th</sup> of September 2013. However the most recent daytime measurement of its internal temperature, taken before the addition of a final layer of cob and a coat of black paint, read twenty-one degrees.

I have also initiated the installation of two larger plants. One is one cubic meter in volume and the other is twenty – large enough to park a Volkswagen in, though inconvenient for a number of reasons. Government contractors will build the smaller plant at the Maitari Bihar monastery, near the renowned Swayambhu Temple Complex. A private company will construct the larger one at BHCH. For making these installations possible I owe many thanks to the efforts of the people who compose my network in Kathmandu, which has grown as a relatively intangible result of my work here. The tangible results – the biogas plants – directly benefit the communities for which we installed them by reducing waste management and fuel expenses. In the near future BHCH's roughly 200 children will be able to eat meals cooked with gas from their cafeteria's kitchen waste. Indirectly the plants benefit everyone a little, because they reduce carbon emissions.

My network will allow the project to have significant effects that go beyond the communities we worked with. For example, Jeeban has offered, and I have contracted him, to conduct regular checkups and maintenance at

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the BHCH plant for the next two years. If any of the school's children or other community members have questions about the plant they can ask him. He can even provide advice from experience on making biogas a career, or at least serve passively as a model. The installation, and Jeeban's willingness to work with the plant moving forward, make his knowledge accessible to hundreds of kids who would not have met him otherwise. They will have the opportunity to play more active roles in Nepal's future biogas industry.

As you have probably already inferred, I have worked especially closely with Jeeban, and am proud to call him my friend. He dropped out of high school to start researching biogas decades ago. He has demonstrated his philosophical and practical commitment to converting urban waste to energy, both in conversation over the many meals we have shared, and by allowing me to help him renovate and publicize a biogas plant he designed and installed ten years ago at his alma mater. The project has also benefited immensely from the efforts of Bindu Manandhar and the philanthropist Anita Manandhar (no relation). These people's advice on how to make the larger installations happen in spite of Nepal's occasionally strangulating regulation process has proved crucial.

Jeeban and Bindu already knew one another before I arrived. My project introduced Anita to the other two, and allowed the three of them to work together more closely than they would have otherwise. More generally, it has linked them and other members of Nepal's biogas industry in new ways – suppliers with users, suppliers with suppliers, and users with users – which may result in new collaborations in the future. My Nepali partners have made new contacts and improved extant ones, which should increase their effectiveness as proponents of biogas, and will likely help them profit from it. This, then, may be the project's most significant effect: It has empowered residents of Kathmandu to help themselves by helping others and making their city a nicer place to live.

Peace is the experience of the sufficiency of the present moment: the feeling that allows people to report with sincerity that nothing is lacking and nothing is overwhelming. For many residents of Kathmandu, in many of its neighborhoods, money is lacking and public garbage is overwhelming. By enabling several hundred biogas users and suppliers to save money by managing garbage, this project for peace has made them more self-sufficient. The experience of sufficiency in oneself increases one's capacity to realize it elsewhere, too – and this promotes peace.

As for me, my time in Nepal has rendered me patienter. This country frustrates one's desire for instant gratification far oftener than the United States ever does. I cannot blame all of the reasons for this on poor infrastructure. For example, whether I am relying on my basic understanding of Nepali or my listeners' basic understanding of English to communicate, I usually must speak slowly or be misunderstood. So though my thoughts may rush around and plunge into a number of nuances that I wish to flush out, I can express these only slowly, using the most economical words that come to mind. Just as I must treat myself with patience to talk this way, I must listen others with patience when they take on the challenge themselves. Ultimately the time I have spent in Nepal this summer, at work and at ease, has made me more confident to connect with other people. I am more able to listen for the meaning that speakers are trying to express, and less predisposed to judge them for the particular words they use.

As I look forward now, the world strikes me as a less terrifying place. I feared coming to Kathmandu alone and faced periodic doubts about myself and my project. Nevertheless, I have made friendships that I expect to last with people I never could have planned to meet, and directly reduced the amount of waste that gets wasted. By carrying out “One Man's Trash” I have helped Kathmandu residents improve their own communities by harnessing the energy in garbage. My collaborators, and the work itself, have in turn helped me to become more patient and capable.

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