ABSTRACT

TITLE:	Biogas in Ecuadorian Highlands
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ABSTRACT: The acquisition and use of biomass fuels for heating and cooking presents a ubiquitous problem for the majority of people on three continents. Inefficient cooking and heating practices (wood burns at 5-8% efficiency and cow dung at 3-5%) not only pollute the home but deplete biomass resources and require increasing amounts of time and energy for fuel acquisition. These factors challenge the sustainability of local and global environments as well as the health and economic prosperity of vast numbers of people in the developing world. In response to these issues, Fort Lewis College students have designed and built four biogas digester prototypes and completed a design for a biogas digester based on the research and results of experiments conducted at Fort Lewis College was developed for use in Chimborazo Ecuador. The recommended design is a 7000 liter balloon style biogas plant constructed using ferrocement. The design includes a construction plan that includes estimated cost of construction as well as operation and maintenance of the system. The financial cost of the digester is an estimate of the cost to purchase the required materials in Ecuador. Biogas utilization for cooking, and for the production of anaerobically digested manure is a unique and realizable opportunity for a vast number of people and communities in both the developing and developed world. Positive impacts are possible in terms of quality of life (reduced time for fuel collection, reduced fuel costs, and improved sanitation, increased crop yields), improved health (reduced indoor smoke from clean burning biogas), economic savings and/or earnings (eliminates need for purchasing traditional fertilizers and creates an opportunity to sell excess manure generated by digesters), and environmental responsibility (utilizes renewable resource and enhances soil fertility).