

## BioD: Clean Energy Solutions, Building Blocks for Peace in Madagascar

Stephanie Ullrich  
International House New York  
Proposal Narrative

### Background Information:

Resource insecurity often leads to societal conflict, yet environmental improvements minimize conflict and set the stage for a more peaceful world. Madagascar has high levels of biodiversity, yet with 75.3% of the rural population in poverty<sup>1</sup> and unstable political institutions following the 2009 coup d'etat, there are possibilities for natural resource exploitation. Furthermore, approximately 88% of Madagascar's population lives in agricultural areas and these individuals are reliant on wood as a cooking fuel. Wood burning causes irreversible damage to the ecosystem through large-scale deforestation practices, which increases tensions and potential conflict around natural resources. Due to the urgent need for an alternative fuel source and the minimization of environmental conflict, Madagascar provides an ideal setting for the implementation of renewable energy technologies, like biodigesters.

### Solution:

This project addresses these peace challenges by providing a sustainable means to generate clean energy. Constructed with cheap and readily available materials, the BioD biodigester unit takes animal and plant waste as inputs. Through controlled bacterial decomposition, methane gas is produced, which can be used as a replacement for firewood. The remaining byproduct is a nitrogen-rich sludge, which is an excellent fertilizer. Operating the device is simple and requires only minimal amount of time. A biogas digester is a holistic approach to tackling issues of peace and insecurity because it provides multiple benefits at the household, local, national, and global levels; these benefits have positive impacts on poverty, gender, health, and the environment, all areas that form the building blocks to sustainable peace.

### Description of the Project:

This project will implement 30 BioD units in rural households in the commune of Miary, in southwest Madagascar, which has an estimated population of 6,000 people. We will also create training modules for use and maintenance of this technology, and design an education campaign on the health, environment, and economic benefits of using clean energy. In addition, the project will conduct an Environmental and Social Safeguard screening through household surveys in order mitigate potential risks that the project might pose. We will also establish a tracking system of BioD units that tracks data such as how much gas is produced, how long it takes to cook, how much CO<sub>2</sub> will be offset, how much time is saved from not having to collect firewood, and how much money is saved on energy costs by using BioD units. Lastly, the project will develop partnerships for future expansion of BioD units into more communities. To do this, we will meet with private sector actors that have a corporate social responsibility mandates, such as Madagascar Oil and Exxon Mobile, to search for stable financing partners in the energy sector, as well as public sector actors such as Peace Corps, the Ministry of Energy, the Office of Environment, and the United Nations Development Programme (UNDP). The implementation plan for the project is as follows:

- **Pre-project:** Our NGO partner and partial-funder, Catholic Relief Services (CRS), will conduct a baseline survey of Miary households to evaluate current needs and listen to the community members. This data will inform the training modules and education campaign that will be designed during the project. Rotaract local partners and university students will purchase BioD unit materials and store them in the BioD office. Transportation will be arranged to project sites.
- During the **first week**, the project will implement 30 BioD units in Miary. Each unit takes 3 hours to install, so we aim to install 6 per day over the course of a week. For the set-up/construction of the units, we will offer stipends to approximately 5 university students to assist with the implementation.
- During the **second week**, we will create training modules for use and maintenance of the BioD units, prepare education sessions on the health, environment, and economic benefits of using clean energy, conduct an Environmental & Social Safeguard screening to mitigate potential risks of biodigester use, and meet with organizations to develop partnerships for future expansion.
- **Post-project:** Due to time constraints, we will continue to work with the Madagascar partners to grow the benefits of the project after we've left the country. Education campaign materials will be handed over to project partners and they will host the education sessions throughout the rest of 2015.

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<sup>1</sup> World Bank, 2010. <<http://data.worldbank.org/country/madagascar>>

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### Goals and Indicators of Success:

**The short-term goals** for this project are to establish a feasible alternative to burning firewood and coal in rural households of Madagascar through the set-up of biodigesters, to create an education campaign and training modules, and to development partnerships for future expansion the use of biodigesters. **Short-term indicators of success** include the implementation of functional biodigester units for 30 households in rural Madagascar, increased awareness about the benefits and necessity of alternative rural energy, 150 people trained in the use and maintenance of the BioD units, and at least 6 meetings conducted with new organizations to discuss the expansion of BioD units in the future.

**The long-term objective** for this project is sustainable peace through resource management in Madagascar that secures multiple environmental and socio-economic benefits, including reduced CO<sub>2</sub> emissions from wood fuel and coal consumption, reduced deforestation rates, and improved rural livelihoods and opportunities for community empowerment. **The long-term indicators of success** for this initiative include: a decrease in resource conflicts, an increase in money saved for alternative activities such as health and schooling, a decrease in CO<sub>2</sub> emissions, and an increase in awareness of the benefits of renewable energy for sustainable development and long-term peace.

### Impact:

By using BioD fuel instead of charcoal or wood, approximately 583 kilograms of carbon dioxide per household are not released into the atmosphere each year. Users will save around \$200 annually by not purchasing fuel, and can spend time previously spent gathering fuel on more productive activities. The intervention will also reduce impacts on forests, and thus minimize resource conflicts. While BioD units have been prototyped over the past year, we have not implemented them in households yet; funding this project will support rural Malagasy people towards economic prosperity, a building block to peace.

### Sustainability:

Much of the success of the project will not be able to be measured while the project team is in Madagascar, and will be demonstrated after the BioD units have been in use for a while later in the summer. However, Stephanie plans to stay connected to the partner organizations and provide additional support they may request after the project has ended. Rahul works with BioD, so he will ensure the effectiveness of the installed units. Stephanie also hopes to return to Madagascar during her Master's program practicum to work on sustainable energy and with these organizations again.

### Project Team and Partners:

The project team is comprised of Stephanie Ullrich (International House NYC Resident, Evaluation Consultant at UNDP), Rahul Mitra (BioD Project Director, Water Sustainability Engineer at CARE International) and other members of BioD in the U.S. and in Madagascar. Stephanie Ullrich has worked extensively in other parts of Africa- such as Namibia, Uganda, and Ghana- on sustainable development work, peace projects, and natural resource programs. Stephanie manages evaluations for UNDP on national-level environmental projects in developing countries, including energy projects in Madagascar. Rahul Mitra has the engineering expertise to assist with the set-up of the BioD units, and has prior experience working in Madagascar and other regions of Africa on renewable energy. Our team also includes engineering students at the University of Antananarivo in Madagascar. These students are currently responsible for constructing test BioD units, measuring their performance, and traveling to the pilot sites to collect data and perform troubleshooting. Stephanie and Rahul both speak French, and these university students speak Malagasy, the language spoken in Miary. We are also supported by the Rotaract Club of Antananarivo, which will assist with collection of BioD user feedback and identification of expansion communities. Other sources of funding include \$5,000 from CRS (committed), \$3,000 from online crowdfunding (projected), and between \$1,000- \$5,000 from the Global Social Ventures competition (projected). In preparation for this project, the team has also reached out to the leaders of GreenCoal Movement, a 2014 Davis Project for Peace grantee in Madagascar, for a potential partnership.