Applicant Information

Applicant Name: Jeff DeGrave
Email: degra021@umn.edu

Project Title: Microturbines and "Cost-Free: Electricity in Rural Honduras: But for whom...and for how long? A Spatial Analysis of Marginalization and Empowerment"

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Dean's name: James A. Parente, Jr.
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How did you hear about this funding opportunity? Geog-grad list-serv

Funding

Total amount of funding requested: $7,850.00

Executive summary (maximum 200 words)

According to the United Nations World Food Programme, Honduras is the “third poorest country in Latin America” and “extreme poverty affects...75 percent of the rural population.” These harsh realities were greatly exacerbated by the impact of Hurricane Mitch in 1998. However, rebuilding efforts have led to a number of technological innovations, transforming the lives of many Hondurans. Río Negro is a coffee-producing community in central Honduras that has experienced significant changes due to the introduction of micro-hydroturbines. The electricity created through the microturbines was initially applied to previously hand-powered coffee depulping machines to accelerate and increase coffee production. Residents soon desired microturbines for domestic use and a form of participatory governance was established to prioritize locations of need. Yet local power relations, and issues of class and gender have excluded various residents from access to electricity. However, the arrival of municipally-supplied power may offer greater equity, but at a cost. The purpose of this project is to spatially analyze which population sectors, based on both the physical and cultural geography of Río Negro, will likely benefit or be encumbered by the two competing forms of electricity and, through this analysis, offer possible solutions for the residents of Río Negro.
Approvals

Check all appropriate approvals required for your proposal. Approvals must be obtained prior to receipt of funding. If you have applied for approval but have not yet received it, indicate that below.

<table>
<thead>
<tr>
<th>IRB</th>
<th>Yes</th>
<th>No</th>
<th>Application pending</th>
<th>Will be applying in March, 2012</th>
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<tr>
<td>IACUC</td>
<td>Yes</td>
<td>No</td>
<td>Application pending</td>
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<td>Other</td>
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<td>No</td>
<td>Application pending</td>
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</tr>
</tbody>
</table>

Checklist

- X The proposal is 1000 words or less excluding budget, biographies, references and citations.
- X The proposal includes a work plan with a specific timeline using months or quarters to identify work to be done and completion dates.
- X The proposal includes a 1-2 paragraph biography of the applicant and all co-investigators.
- X The budget form is complete including the funds sought for this project, other pending applications for this project, and the amount/source of matching or other funds.
- X The applicant’s faculty advisor is copied on the application email. Professional students w/o advisors check NA.
- X All necessary approvals are pending or received.
Microturbines and “Free” Electricity in Rural Honduras:
But for whom...and for how long?
A Spatial Analysis of Marginalization and Empowerment

Overview
Hurricane Mitch of 1998 was one of the most devastating natural disasters to strike Central America in recorded history. (United Nations World Food Programme) Mitch claimed over 11,000 lives and has exceeded over $5 billion in damages—a figure that continues to rise. (NOAA) However, the destruction caused by Hurricane Mitch helped inspire myriad innovations that have transformed the lives of hundreds of thousands of Hondurans. One new technology has greatly impacted Río Negro, a small, close-knit mountain village of Central Honduras: micro-hydroturbines that have been employed to produce “cost-free” electricity. Residents have managed this new technology through participatory governance; however, many locals feel they remain excluded from the benefits of access to electricity. (Sidman 2011)

Although the microturbines employ the natural and “cost-free” energy created through the forces of gravity on mountain streams, access to this electricity has remained limited, constrained by physical factors such as elevation, stream head, and distance from a suitable water source. In addition, social factors, such as the degree of wealth required for the purchase of a microturbine, community standing, class and gender have also empowered and marginalized certain population sectors. Many of those alienated from access to power advocate the introduction of municipally supplied electricity to enable a more equitable distribution of this valued resource. Inclusion onto the grid, however, will legally impose usage fees on all residents of Río Negro—including those who already receive “cost-free” electricity via the microturbines. (Zavala and Oviedo 2012) Owners of the microturbines fear that inclusion of Río Negro into the power grid of Comayagua will eventually create energy dependency for the community, resulting in continually higher fees and costs. (Zavala and Oviedo 2012)

This research project will spatially analyze which population sectors, based on both the physical and cultural geography of Río Negro, will likely benefit or be encumbered by the two competing forms of electricity and, through this analysis, offer possible solutions for the residents of Río Negro.
Project’s Nature and Importance
My research aims, in part, to broaden what is currently limited discourse on the evaluation of empowerment and marginalization in participatory mapping projects in Latin America. (Wainwright 2008, Wainwright and Bryan 2009, and Wright 2009, 2006) This research is also unique as it combines both the natural and social sciences as well as quantitative and qualitative research methods, while addressing issues of law, environment, economics, and participatory governance. As modern technology permeates even the most remote regions of the developing world, it is essential to consider pre-existing issues of local power relations, gender, and class that can undermine the benefits of new technologies. The lessons learned from this research can serve to inform both the methodologies employed and the issues that invariably arise as new technologies continue their rapid propagation throughout the Third World.

Research Questions
1. To what degree does the presence of electricity in Río Negro suggest both the empowerment and marginalization of various residents within the community?
2. How do the physical and cultural geography of Río Negro reflect this empowerment and marginalization?

Methodology
This multi-method research design will involve the triangulation of three methods of inquiry: interviews, governmental documentation, and GIS, as is illustrated below:

Interviews

Governmental Documentation GIS

Research Questions

Interviews: I will be interviewing current owners of microturbines as well as those households without access to electricity. Through these interviews I will catalogue opinions that describe the primary barriers to access to electricity—such as gender or class bias, economic hardship, as well as physical obstacles such as the distance from their household to a sufficiently flowing water source—along with the reasons why some residents prefer to have power supplied by the municipality and others via the microturbines. I will also be recording the geographic coordinates of the presence and absence of microturbines on a GPS unit to be entered into a GIS (Geographic Information Systems), a digital mapping and analysis computer program.

Governmental Documentation: Satellite imagery, aerial photography, historical and current topographical maps, property ownership maps, and other governmentally-produced geographic
information will provide details of the physiography and the human-built environment of Río Negro. I will then compare this “official” information with GPS readings taken of the locations of the microturbines. Empowerment and marginalization will be reflected in the physical landscape through dwelling size, land ownership, and other physical geographic data. Indirect evidence of empowerment and marginalization may also appear through historical comparisons including improvements to nearby roadways, deviations in water flow, and other potential environmental impacts of the microturbines.

GIS: A GIS will store and facilitate the analysis of all information collected and produce a variety of maps. The first map to be constructed will be a “Map of Empowerment,” reflecting the locations of microturbines in Río Negro, which will be tested for correlations with gender, class, and the local physical features and environment. Conversely, the GIS will also assist in generating a “Map of Marginalization” by plotting “voids” of electricity. These “voids” will serve to represent not only the current absence of microturbines, but to offer perspective on the motivations for access to the city power grid.

Timeline

2012
January: Completed exploratory research in Honduras to test viability of research project
March – April:
• Successfully complete preliminary exams
• Fulfill IRB prerequisites
• Finalize interview questions
• Acquire any available GIS data of Comayagua and Río Negro through online resources
June – August: Return to Honduras to begin research, including:
• Conduct interviews with residents of Río Negro
• Acquire GPS data at sites of interviewees
• Obtain maps and other governmental documents from the City of Comayagua
September – December: Dissemination of data, including:
• Enter, clean, and organize data
• Enter all information into the GIS
• Create maps of empowerment and marginalization
• Perform spatial data analysis of maps to identify trends, correlations, and significant spatial relationships
• Present findings to committee members

2013
January: Return to Honduras for further research (optional)
February – July: Dissertation:
• Incorporate data, findings, and analyses into dissertation
• Create first draft of dissertation
• Perform edits and revisions of dissertation as needed
August: Complete final draft and defend dissertation
Biography
Jeff DeGrave is a doctoral student in the Department of Geography. After traveling to communist Poland in 1991, he acquired a keen interest in international development for disadvantaged populations outside of the U.S. Of greatest import to him are the possibilities for development on a local scale, led by local residents. This curiosity led to his Bachelor’s degree in Geography and a Master’s degree in International Affairs, particularly focused on development issues. He applied this knowledge first-handedly with a Madison, Wisconsin-based non-governmental organization, the World Council of Credit Unions (WOCCU), that supports microfinance initiatives throughout the world. He served as the liaison for Latin America—an experience that provided him access to numerous grassroots movements and the issues encountered within them.

Since that time, he has traveled extensively in Latin America and has applied his knowledge as an instructor of several classes that relate to international development in Latin America, including Latin American and Middle American Geography at the University of Wisconsin-Eau Claire. He was also able to transfer his experiences in Latin America into a book, serving as co-author of one issue of McGraw-Hill’s Taking Sides book series, “Latin American Issues” in 2008. He is hopeful to earn dissertator status by the spring of 2012 and that this grant will allow him to begin his dissertation research in Honduras at the onset of summer. He would eventually like to apply his research by actively participating in grassroots international development projects in Latin America upon completion of his Ph.D.

References
Sidman, Gabriel. Email communication: 10/19/11.
Zavala, Adalid and Hector Oviedo Castellanos. Series of interviews conducted from January 2-8, 2012.
Budget Form

Project Title: Microturbines and “Cost-Free” Electricity in Rural Honduras: But for whom...and for how long?

<table>
<thead>
<tr>
<th>Personnel costs</th>
<th>Description &amp; justification</th>
<th>Requested funding</th>
<th>Matching/other funding</th>
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<td>1</td>
<td>Your salary (stipend)</td>
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<td>2</td>
<td>200 hrs. x $21.88 (adjunct wage at UW-Eau Claire where I teach, no fringes)</td>
<td>$4,376.00</td>
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<tr>
<td>3</td>
<td>Other personnel</td>
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<td></td>
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<tr>
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<td>Other personnel</td>
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<td>6</td>
<td>Speaker Honoraria</td>
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<td></td>
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<td>7</td>
<td>Supplies &amp; Services</td>
<td></td>
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<tr>
<td>8</td>
<td>Handheld GPS: $150 (for plotting locations of microturbines); Digital Voice Recorder: $100 (for interviews); will keep equipment in case a return trip to Honduras is required</td>
<td>$50.00</td>
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<td>9</td>
<td>R/T airport shuttle from Eau Claire, WI to / from MSP: $74; Airfare R/T MSP / San Pedro Sula: $800; Bus R/T San Pedro Sula / Comayagua: $50. Truckride R/T: Comayagua / Rio Negro: $50; Per Diem: 40 days in Rio Negro: $1,400 ($35 / day); 10 days in Comayagua: $750 ($75 / day) <strong>NOTE:</strong> Maximum Federal Per Diem for Honduras: $129/day</td>
<td>$250.00</td>
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<td><strong>Subtotal research supplies, equipment, travel, other</strong></td>
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<td>11</td>
<td><strong>TOTAL BUDGET</strong></td>
<td><strong>$7,850.00</strong></td>
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1. Stipend justification. You must justify the amount of stipend you are requesting by identifying the number of hours you plan to work on the project and the hourly wage used for research assistants in your department. Include fringe benefits.
2-4. Identify all other personnel to be paid from this grant including interpreters, travel guides, etc. and justify their salary by identifying the number of hours they will work and the hourly wage. What is the hourly wage based on?
6. For colloquia, identify the number of speakers and the amount of honoraria you will provide.
7. Supplies and services. List out all supplies and their estimated costs. Explain in line 7 or in the body of your proposal what the supplies will be used for.
8. Equipment costs are allowable only if the justification clearly shows that the equipment is necessary for the project. Include explanation of what will happen to equipment at completion of project.
9. Travel costs must include a description of the purpose of the travel, start and stop dates of travel, transportation costs, housing costs, and allowable per diem (use University rates found at http://travel/umn.edu).