

Catalyst Grant Final Project Report

Project title: *Training in participatory methodology to investigate vulnerability and adaptive capacity to extreme climatic events in the Northern Coast of Ecuador*

Project team:

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Co Investigators: **Dr. Maria Lemos**, Professor and Associate Dean for Research, School for Environment and Sustainability, University of Michigan

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Additional Team Members: **Dr. James Trostle**, Professor, Department of Anthropology, Trinity College, CT

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1.0 Summary:

The objective of this project was to develop regional institutional capacity to engage vulnerable communities in northern coastal Ecuador in the process of identifying priorities and devising adaptation strategies to confront the repercussions of climate change. Specifically, we partnered with the **Universidad Técnica Luis Vargas Torres de Esmeraldas (UTELVT)** to develop expertise and protocols for community-based, participatory environmental research.

Our **key project outputs** included (i) a workshop for UTELVT faculty and select undergraduate students on participatory action research methods, led by study team member Dr. Trostle, (ii) a pilot collaboration with our UTELVT co-investigator, Betty Corozo, and two UTELVT students in the form of a participatory risk assessment of three recently flooded communities in the region, and (iii) a close-of-project meeting to discuss results of the pilot study with local stakeholders (members of the research community and relevant local governmental and non-governmental organizations). A **key outcome** of this project is the strengthening local institutional capacity to design research projects aimed at addressing the impacts of climate change on communities in Esmeraldas province through participatory research to explore and address climate-related vulnerability in this region. **Next steps** involve an (i) exploration of further opportunities for research training for UTELVT faculty and students and (ii) exploration of collaborative projects between the University of Michigan, UTELVT, and local stakeholders.

2.0 Project Background and Approach:

The coast of Ecuador is experiencing increasingly dramatic and unpredictable patterns of flooding and drought because of climatic variability and change. Therefore, there is an immediate need to help build the adaptive capacities of communities, as well as to build the capacity of the local institutions that support these communities.

Therefore, the purpose of the project was to strengthen adaptive capacity to deal with climate change. We aimed to **build capacity at the regional level** by developing the capacity of UTELVT to engage in community-based environmental research the Universidad Técnica Luis Vargas Torres de Esmeraldas (UTELVT). To accomplish this, we (i) conducted a conference on participatory action research methods, led by study team member Dr. Trostle and attended by UTELVT faculty and select undergraduate students, and (ii) together with our UTELVT co-investigator, Mrs. Corozo, two UTELVT students, and one University of Michigan student, conducted a participatory risk assessment of three recently flooded communities in the region.

Our local partner, UTELVT, is a university based in the city of Esmeraldas, Ecuador. UTELVT currently offers five degree programs, including social science and development studies, environmental studies, as well as engineering, education, and administration. Students graduating from the social science and environmental tracks typically seek work in the local ecotourism industry, in the agricultural sector, or with local governmental and nongovernmental organizations, and UTELVT has strong ties with communities and local organizations throughout the region. Recently, UTELVT has identified the development of the capacity of its faculty and students to engage in scientific research as an institutional priority. Their commitment to development in this area is demonstrated, for instance, by the recent creation of a University-wide, peer-reviewed journal (*Revista Repique*, now in its forth volume). UTELVT's goal is to develop a faculty that is active scientifically, while maintaining the ideology that any research conducted should include an element of community participation as well as lead to actionable information for the community.

2.1 Scientific Approach: Participatory Risk Assessment

2.1.1 Study Site: This study was conducted in the three riverine communities in Esmeraldas, the northernmost coastal province in Ecuador. Three communities were chosen following consultation within the study team, based on four criteria: (i) prior participation in the 'Environmental Change and Diarrheal Disease: A Natural Experiment' (EcoDess) study, which was conducted by Drs. Eisenberg and Trostle in the region from 2003-2012; (ii) remoteness (characterized by proximity to road), (iii) community organization, and (iv) ethnicity. The communities of San Miguel and Trinidad are predominantly Afro-Ecuadorian communities, while Guadual is a predominantly indigenous (Chachi) community. The villages are situated along the Cayapas River, within the buffer zone of the Cotacachi-Cayapas Ecological Reserve and are only accessible via river transportation. Residents in all three communities rely on subsistence farming, as well as some small-scale commodity crop production; plantains, leafy greens, cacao, cassava, beans, and fruit are commonly cultivated for personal consumption as well as for sale at regional markets.

2.1.1 Study Methods: Focus group discussions were held in each of the communities. Two focus group discussions were held in each village, separating the men from the women to overcome potential gendered biases and ensure equal participation of both groups. Additionally, the participants invited to the focus groups were selected to ensure even participation of younger and older generations. Focus groups were conducted throughout June of 2017.

The focus group discussion guide was developed through a review of the literature, then contextualized and reviewed together by the study team before the data collection. Given that the objective of the study was to identify and better understand interactions between perceived risks and stressors (specifically climatic and non-climatic) and how they affect local vulnerabilities, questions in both the focus group and free list interview guide were intentionally worded broadly to avoid prompting for specific responses. Additionally, to ensure that the questions were universally understood, vulnerability was framed as an impact to community well-being, while stressors and risk were framed as problems or worries. In the focus groups, we used two different participatory activities to gather information on experienced and perceived problems within the community. The first activity was a map drawing session to document changes in the communities where the focus group participants were divided into two groups based on age (individuals 40 years old or younger, and individuals older than 40 years) then asked to draw a map of how their community looked like before (20 or more years ago) and a map of how it looks like now. The goal of this activity to get the participants to visualize their community and begin to think about latent risks or problems that impact local well-being. The second activity was a vulnerability matrix exercise where community members (once again divided into two age groups) were asked to identify and rank problems and resources within the community that affect their well-being. Each group was given a set of blank index cards and was asked to write down first, all the problems in the community, then all community resources, and then rank each problem or resource identified as high, medium, or low importance. As with the free listing, if climate change was not mentioned, then the respondents were prompted to also identify climate-related problems that affect their well-being.

3.0 Findings

3.1 Findings of participatory training and stakeholder's meeting

There is a significant interest on the part of the local partner, UTELVT, to increase research capacity to take on a larger role in the evaluation and resolution of issues within the province of

Esmeraldas. This interest is an officially stated objective of the institution and is also reflected by genuine enthusiasm on the part of the faculty. Across departments, faculty appeared to be particularly interested in research reflecting the impact of growing tourism industry of the region, in education research, in ecological research, and in research affecting the wellbeing of rural communities.

3.2 Findings of participatory risk assessment activity:

3.2.1 Overall summary: Overall, participatory risk assessment activities within the communities suggested that community members perceived climatic patterns to be less predictable in the past, and felt that flooding had, correspondingly, become less predictable and more severe when it did occur. However, these floods, although disruptive, not seen as the most significant problem affecting the welfare of communities. Instead, communities had developed mechanisms to deal with flooding events and were more concerned about issues related to employment and income, access to basic services, food and water security, and health. Interactions between climatic and non-climatic stressors were common (for example, unpredictable weather patterns affected crop yields, increased insect populations, and were exacerbated by deforestation). The ability of communities to collectively organize and petition for services or rights was regarded as a critical resource to confront existing challenges.

3.2.2 Perceived Changes: Several changes over time were noted across the three communities. Respondents described a lack of definitive seasons (rainy winter season and dry summer season) compared to the past and noted that seasons had become unpredictable (i.e. it was impossible to predict what months might be dry, and which might be rainy). All communities mentioned the contamination of river water by the presence of mining companies, loggers and unsafe fishing practices (e.g. throwing chemicals in the water to stun fish) that had made river water unsafe source for human consumption as well as for bathing.

3.2.3 Perceived Threats to Wellbeing: Common stressors mentioned in FGDs are described in **Table 1**. There were several shared stressors between communities, as well as some stressors that were unique to each community. In San Miguel (the largest community), a lack of security was regarded as a specific community concern, while in Trinidad the need for a public boat to provide transportation was regarded by community members as a current, key concern. In Guadual, the lack of infrastructure (e.g. a pharmacy, potable water) was regarded as key stressor. Men's focus groups tended to emphasize issues related to agriculture, and a lack of a fair market, or collection centers where they could sell their crops for a fair price, was considered a major limitation for the generation of income, whereas women's focus groups tended to emphasize services such as the need for water, sanitation, and health care services.

Although flooding was considered more unpredictable and severe than in the past, it was not seen as the most significant problem affecting the welfare of communities. Instead, communities had developed mechanisms to deal with these events largely through social networks (family, neighbors, friends, support between communities, etc.) and life returned to normal when river levels fall after each flood. In response to unpredictable patterns of flooding, farmers had reduced production in lowland areas (fertile soil close to the river) in favor of poorer-quality land at higher elevation.

Interactions between climatic and non-climatic stressors were common, for example, pollution and deforestation were linked to an increase in insects, and a lack of clean drinking water; and

deforestation was linked to a decrease in animals that could be hunted for food, resulting in food insecurity and a greater reliance on formal employment.

Table 1: Common threats to wellbeing reported by community FGDs

Theme	San Miguel	Trinidad	Guadual
<i>Environmental Pollution</i>	Environmental Pollution Poor waste management	Pollution of River Deforestation	
<i>Health</i>	Lack of health post	Increase in chronic diseases	Lack of pharmacy
<i>Lack of formal Employment options</i>	Lack of formal employment options	Lack of formal employment options Out-migration of young people	
<i>Infrastructure</i>	Lack of security	Lack of public transportation	Poor infrastructure
<i>Basic Services</i>	Lack of potable water system Poor waste management Lack of teachers Lack of higher-level education		Lack of potable water system Lack of Latrines
<i>Agricultural production</i>	Lack of a market to sell agricultural products		Lack of a market to sell agricultural products Unfair prices for agricultural products

3.2.4 Perceived strengths: Community members emphasized communal support and unity as a strength in all three communities, and also mentioned tensions between individuals or households as a major threat. Community members also mentioned nearness to nature as a benefit of community life, with one respondent commenting, “In San Miguel we breath pure air, we live in harmony with nature, all these benefits are reinvested in the community (*“En San Miguel se respira aire puro, se vive en armonía con la naturaleza, todos los beneficios se reinvierten en la comunidad”*)”. Land rights in the area are communal, and individuals who are officially ‘members’ of a given community (typically by birth) have the unique right to hunt, farm, or sell on communal land. Therefore, there are practical economic benefits of membership in a community that is effective in maintaining control of communal land rights, and expressions of appreciation for nature and collective solidarity might be seen as expressing economic, rather than (or in addition to) emotional or social benefits. Relatedly, respondents in Guadual described services deriving from the community’s participation in Socio Bosque, a government program that provides economic benefits to community members through conservation agreements.

4.0 Outputs

4.1 Output 'A': Completion of a workshop in participatory research methods, at the Universidad Tecnica de Luis Vargas Torres, led by Dr Trostle. The target audience for this output is faculty at UTELVT, as it is hoped that the information presented will be useful and allow them to introduce participatory research methods to their research in the province, thereby expand the scope and rigor of their scientific work and increasing community engagement. is output was completed.

4.2 Output 'B': Qualitative data generated through participatory research activities involving leaders and other community members, in three communities, recently affected by flooding. This output is complete, as research activities were completed in summer 2017. There are several audiences for this output, including (i) UMich study team members, who may continue working in these communities in the future on health-specific issues, but will benefit from the information described in the FGDs, which describes the broader landscape of vulnerability of the communities (ii) Mrs. Corozo, her students, and other faculty at UTELVT, who gained practical research experience through their collaboration in the project, and (iii) community members, who benefited by the participatory process by reflecting on their recent experiences with flooding and other challenges, and to consider how these experiences can be used to inform strategies to develop their communities moving forward.

4.3 Output 'C': A scientific publication describing project results. This output has not yet been completed, but our research group continues to collaborate in moving this forward. Preliminary analysis (presented during the stakeholder's meeting in Esmeraldas) will be deepened through comprehensive qualitative analysis. As described in section 4.2, Ms. Gutierrez has taken the lead in the work, completing the first part of analysis (Guadual) in Fall 2017 as an independent study (advisor: Dr. Maria Lemos) and has now (Winter 2018) made the analysis her official Masters' thesis project (advisors: Drs. Rebecca Hardin and Gwentyth Lee- Dr. Lemos continues to be involved in a senior mentorship capacity). Part of Ms. Gutierrez's task in developing her thesis is to precisely define the target audience for this work, but it may include members of the global development research community as well as members of the local (South American or Ecuadorian) development community.

4.4 Output 'D': A close-of-project meeting with stakeholders to discuss results of the pilot study and promoting the utility of participatory action research for tackling climate-related vulnerability). This activity was completed in late July 2017. The target audience of this activity were stakeholders (including community leaders), who were presented with preliminary results through the stakeholder's meeting held in Esmeraldas in late July 2017. Conference attendance (based on sign-in) is estimated at ~108 people. The major organizations that sent attendees included our local partner (UTELVT), the provincial government (GADPE), the ministry of the environment, the ministry of tourism, the ministry of education, the local health department, the office of risk Management, the major publicly owned petroleum company (FLOPEC), and local press. It is our hope that this stakeholder meeting (i) help to highlight not only the specific stressors that communities in the region are faced with (as most stakeholders are familiar with these already) but also potential interactions between these stressors, and (ii) help to introduce stakeholders to concepts of participatory research, and participatory implementation, that may be useful to them in their continued work and (iii) make stakeholders aware of resources in the region, both through local academic institutions such as UTELVT and international institutions such as the University of Michigan, that can be help to inform their work.

5.0 Outcomes

5.1 Outcome 'A': Within the University of Michigan, closer partnerships between the School of Public Health and the School of Environment and Sustainability.

It is our opinion that this outcome has been met, given that, through the project, Dr. Eisenberg and Dr. Lee (SPH) and Dr. Lemos and, more recently, Dr. Hardin (SEAS) have begun to collaborate more closely. Specifically, the Catalyst project has represented an opportunity to begin to involve these faculty members into Dr. Eisenberg's broader ongoing research activities in Ecuador, and other collaborations between the two schools (for example, the potential development of a cross-school student group) are also being discussed.

5.2 Outcome 'B': A strong collaboration network to support future research involving the University of Michigan, Trinity College, and UTELVT.

It is again our opinion that this outcome has been met, given that mutual interest in future collaborations between the University of Michigan, Trinity, and UTELVT has been established. Conversations about the potential for specific collaborations have been ongoing, however, there is a need to identify projects and funding sources that meet the interests of UTELVT, primarily related to a desire for continuing education opportunities and mentored support for research project development.

5.3 Outcome 'C': Practical training for one student from Michigan and two students from UTELVT, including summer field experience

This outcome has been completed, as UM SNRE master's student Helen Gutierrez has been involved with the project since the beginning. She participated in the development of a participatory focus group guide, participated in fieldwork, presented project results to stakeholders, and has taken the lead in data analysis at UMich. Ms. Betty Corozo also identified two UTELVT bachelor's students (Luis Rodriguez and Sabrina Tenorio), who participated in field work (given their exam schedules, they were only able to do so in 2 of the 3 communities and presented results to stakeholders).