

Consortium on Law and Values in Health, Environment & the Life Sciences 2017-18 Student Proposal Cover Page

Applicant Information

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| Applicant name(s): | Anne B. Christianson | Email: | Chri1942@umn.edu |
| Project title: | Examining Ecosystem-based Approaches to Climate Change Adaptation: The Intersection of Gender Capabilities and Biodiversity Conservation | | |
| Department: | Department of Forest Resources | College: | Food, Agricultural and Natural Resource Sciences (CFANS) |
| Degree program: | PhD, Natural Resources Science and Management | | |
| Faculty advisor: | Dr. Kristen Nelson | Faculty advisor email | nelso468@umn.edu <input type="checkbox"/> No advisor |
| Dept. Head: | Dr. Mike Kilgore | Dept. Head's email: | mkilgore@umn.edu |
| Dean: | Dr. Brian Buhr | Dean's email: | bbuhr@umn.edu |

How did you hear about this funding opportunity?

Consortium e-mail
 Consortium website
 The Brief
 Dept. email/newsletter
 Other (specify)

Funding

Total amount of funding requested: **\$ 5460.00**

Executive summary (maximum 200 words)

It is widely recognized that women are more vulnerable to climate change risks, due to income poverty, reliance on natural resources, and lack of decision-making power. Adaptation initiatives that consider gendered vulnerabilities are necessary to help human and ecological communities prepare for the likely outcomes of climate change, and reduce risks including food insecurity, morbidity, and mortality. Ecosystem-based adaptation (EbA) is a relatively new approach to adaptation which seeks to use biodiversity and ecosystem services to increase human resilience to climate change. EbA programs are being implemented globally by human development and environmental conservation groups, however an empirical evaluation of these programs' impacts on women's resilience remains unexamined. Working alongside partners at the International Union for Conservation of Nature (IUCN) and The Mountain Institute (TMI), I am undertaking an interdisciplinary research project which explores the intersection between human adaptation measures and biodiversity conservation. These issues will be examined through the application of the capabilities approach to individual interviews undertaken in resource-dependent communities near Mount Elgon National Park, Uganda. Results of this research will directly inform future global adaptation program governance and contribute significantly to the human development and climate change adaptation literatures.

Approvals

Check all appropriate approvals required for your proposal. It is not necessary to have all approvals at the time of proposal submission; however, approvals must be obtained prior to receipt of funding. If you have applied for approval but have not yet received it, indicate that below.

IRB Yes No NA Application pending

Other Yes No NA Application pending Specify:

Checklist—for reviewer use

- The proposal is 1000 words or less excluding budget, biographies, references and citations.
- The proposal includes a work plan with a specific timeline using months or quarters to identify work to be done and completion dates.
- The proposal includes a 1-2 paragraph biography of the applicant and all co-investigators.
- 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.
- The applicant's faculty advisor is copied on the application email. Professional students w/o advisors check No Advisor.
- All necessary approvals are pending or received.

Examining Ecosystem-based Approaches to Climate Change Adaptation: The Intersection of Gender Capabilities and Biodiversity Conservation

Background

Modest projections for greenhouse gas emissions suggest dire impacts for those most vulnerable to climate change (Scarano & Ceotto, 2015), necessitating proactive adaptation programs. *Climate vulnerability* is the susceptibility of an individual, community, or system to risks, and includes both risk exposure as well as the capacity to adapt (Nelson, Adger, and Brown, 2007). Vulnerability is influenced by social status, income, age, education, and gender. Despite the variations in climate risks around the world, it is widely acknowledged that women are most vulnerable due to lower incomes, reliance on natural resource extraction, and lack of decision-making influence within their communities and their households (Alston, 2013; Carvajal-Escobar et al., 2008; Denton, 2002).

In recognition of this vulnerability, there is a growing effort to include women in adaptation programs, as both practitioners and beneficiaries (Holvoet & Inberg, 2014). Recently, *Ecosystem-based adaptation* (EbA) has emerged as a comprehensive, flexible, and gender-sensitive option to address climate change vulnerability. EbA is a human-centric approach which uses biodiversity and *ecosystem services* (the benefits people derive from nature, e.g. pollination and clean water) to help communities adapt to future climate change effects (CBD, 2009). These programs are designed to increase *resilience*, or the ability to resist, recover from, and prepare for future climate risks.

While increasing human resilience is the primary goal of EbA, these programs also promote ecological conservation. *Biodiversity richness*, or the number of species in existence, is decreasing around the world due to human actions (Heller & Zavaleta, 2009). Biodiversity underpins the ability of ecosystems to function (Mooney et al., 2009), and is a crucial component in the delivery of ecosystem services (Wamsler et al., 2016). Traditional adaptation programs rely on built infrastructure; in contrast, EbA uses methods such as ecological conservation and habitat restoration to achieve adaptation objectives (Mensah et al. 2012). These methods underscore the connection between resilient ecological systems and resilient human communities.

Research Objectives and Methodology

Although EbA programs are implemented in dozens of countries, from developed to least developed nations, their impact on women's resilience is under-examined. My research seeks to assess the effectiveness of EbA programs in reducing women's vulnerability to climate change in resource-dependent communities. The primary research questions include:

- How do EbA programs influence individual women's capabilities that can lead to functional climate resilience?
- How can gender inclusion in decision-making help overcome adaptation governance challenges?

I use the *capabilities approach* to examine the impact of EbA programs on women's resilience. The *capabilities approach* challenges scholars and institutions to rethink how society should define developmental success and human well-being. It argues that an individual's freedom to live a chosen life is realized through *capabilities*, or the real opportunities to achieve *functionings*, which can be understood as what a person values and achieves (Sen, 1999). This approach is useful in evaluating the well-being of women because of its focus on the individual; previous measures of development success relied

on national or household-level monetary metrics, which obscured national wealth gaps as well as income and power inequalities within the household (Ferber, 2004).

I am operationalizing the capabilities framework by conducting a gender analysis in collaboration with the Global Mountain EbA Programme, a joint activity of the International Union for Conservation of Nature (IUCN) and The Mountain Institute (TMI). This program is delivering critical adaptation benefits to communities in Uganda, Peru, and Nepal. My work will provide an empirical foundation for expansion of the Programme into Kenya, Colombia, and Bhutan, and help improve the effectiveness of EbA interventions for women.

My fieldwork will take place in the districts surrounding Mount Elgon National Park, Uganda, from July-September 2018. I will survey 150-200 individuals in households participating in EbA programs such as forest restoration and water conservation. The surveys will collect demographic information and climate change perception data, and will include questions relating to capabilities and functionings.

In addition to issues of human resilience, I will include survey questions regarding biodiversity to better understand how individuals value, perceive, and interact with local ecosystems. The literature demonstrates that studies which include both social and ecological research components lead to natural resource management practices that better fit local contexts (Strauch et al., 2016). Inclusion of biodiversity as a factor to understand climate change adaptation is critical when assessing EbA, as biodiversity underpins the ecosystem services utilized by these interventions. My research will shed light on how EbA programs can benefit biodiversity while effectively increasing women's resilience.

Anticipated Project Outcomes

A grant from the Consortium on Law and Values in Health, Environment, and the Life Sciences will allow me to carry out field research which makes a significant contribution to both the theoretical literature as well as to the advancement of adaptation interventions. The primary theoretical contribution is through the application of the capabilities approach. Although the approach underpins several international development indexes, the original framework does not include environmental sustainability considerations (Holland, 2008). Its emphasis on individual freedoms, including material freedoms, fails to consider how a degraded environment impedes development goals (Ballet et al., 2013). Few studies use surveys to examine capabilities and functionings (Robeyns, 2006), and to my knowledge there is no research using this approach in a climate change adaptation context. My empirical research will expand the capabilities approach to include biological indicators relevant to resilience, making a significant contribution to the framework.

Results from analysis of my field work data could help shape an expanding adaptation field while having immediate practical application. As both the conservation and development communities recognize, program management requires new data to strengthen the governance process (Tompkins & Adger, 2003). However, limited funding and organization capacity impede the critical monitoring and evaluation components of EbA. My gender analysis can help guide implementation strategies and evaluation tools to improve future programs, while my inclusion of biodiversity as an evaluation factor will provide insight into how organizations can work with communities to enhance local ecosystems. In addition, my collaboration with the Global Mountain EbA Programme will lead to an integration of my findings into institutional and program expansion.

Work Plan

| | 2018 | | | | 2019 |
|---|-----------|------------|-------------|------------|-----------|
| | Quarter I | Quarter II | Quarter III | Quarter IV | Quarter I |
| Finalize field work dates and itinerary | X | X | | | |
| Finalize interview and survey guides | | X | | | |
| Receive final IRB approval | | X | | | |
| Field work and data collection | | | X | | |
| Data analysis | | | X | X | |
| Manuscript development | | | X | X | |
| Finalize manuscript, present findings to collaborators | | | | | X |

Biographical Statement

Interdisciplinary environmental conservation is a constant theme that runs through my studies and professional experience. After obtaining a degree from St. Olaf College in environmental science and policy, I received a Masters of Science with Distinction from the University of Oxford. For my thesis, I conducted interviews and collected survey data to help guide the development of sustainable fisheries in Cambodia. Upon strengthening my ecological training through research on endangered birds in St. Lucia and on meerkat behavior in South Africa, I sought professional opportunities that took multidimensional approaches to conservation. As an aide in the U.S. Congress, I managed an environment and energy legislative portfolio, analyzing policy and writing legislation on behalf of the Congressman. In my role with Ocean Conservancy, I developed and advocated for science-based marine policy in federal agencies. I continued this work during my PhD degree, holding fellowships in the U.S. House of Representatives Committee on Natural Resources and with the White House Council on Environmental Quality.

My research interest in the intersection of environment and gender is underscored by my commitment to women's leadership in the sciences. I was the Vice President of DC EcoWomen, a non-profit with over 5,000 members working to help women become leaders in the environmental field. In addition, in 2016 I was selected as one of 76 female scientists globally to take part in a leadership initiative and expedition to Antarctica.

I was drawn to the Natural Resources Science and Management PhD program because it offered the flexibility to design an interdisciplinary dissertation. I independently built the relationships foundational to my research, initiating conversations with international academics, policy-makers, and practitioners regarding innovative research opportunities. This process has allowed me to pursue an interdisciplinary project with leading experts in both the human development and biodiversity conservation fields, and prepares me to bridge the gap between these disciplines when I reenter the professional world.

Budget

| Project Title: Examining Ecosystem-based Approaches to Climate Change Adaptation: The Intersection of Gender Capabilities and Biodiversity Conservation | | |
|---|---|--------------------------|
| Provide justification along with costs. | | Requested funding |
| Category& instructions | Justification | Amount |
| Your stipend <i>Maximum of \$5,000</i> | | \$0 |
| Speaker honoraria (for colloquia) | ___ speakers x \$ _____ honorarium | \$0 |
| Supplies & Services <i>Identify and explain use here or in the body of your proposal.</i> | Translator (\$700): although English is spoken throughout many of the project communities, it is likely that there will be a need to employ a translator to complete some interviews. Cost is estimated at \$50/day for two weeks of translation services. Miscellaneous field expenses (\$350): including share of gas for transport to and from project communities with IUCN field site team (\$200), and Ugandan SIM card for transportation, project, and safety communication purposes (\$150). | \$1,050 |
| Equipment <i>Identify and explain use. Allowable only if the equipment is necessary for this project. All equipment must be given to your dept. at the completion of your project.</i> | Costs include equipment needed for the gathering, storage, and analysis of data in the field: Sony Stereo IC Digital Voice Recorder to enable recording of interviews (\$70); Laptop, 11-inch screen, for field data storage and analysis (\$220); 64 GB flash drive for data storage and transfer (\$20). After completion of the project, equipment will be donated to the Nelson Lab for future projects. | \$310 |
| Travel <i>Indicate the purpose of the travel, estimated dates of travel, transportation, housing and allowable per diem costs (see travel.umn.edu).</i> | Transportation (\$1,900): Amount includes average round-trip airfare from Minneapolis, MN (MSP) to Entebbe International, Uganda (EBB), departing in July and returning in September, 2018 (\$1,650). Contact will be made with IUCN and TMI collaborators in the capitol of Kampala, before traveling overland to the field site in Mt. Elgon National Park (\$250). Room and Board (\$2,200): Amount is based on feedback from IUCN field teams. Overnight room and board in Kampala is estimated at \$50/night (14 nights, \$700), and field-based room and board at \$25/night (60 nights, \$1,500). Field-based room and board includes low-cost hostel accommodation and groceries. | \$4,100 |
| | Subtotal research expenses (2-5) | \$5,460 |
| TOTAL BUDGET | | \$5,460 |
| Other funding: List other or matching funding you have requested for this project. | | |
| Funding source | | Amount |
| Graduate School International Thesis Research Travel Grant (requested) | | \$5,000 |

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