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Environmental impacts of index-based livestock insurance on rangeland health

Problem Statement:
Index-based livestock insurance (IBLI) protects herders in East Africa and has grown from a pilot program to a national one, but its environmental impacts are under-studied. The proposed work assesses the environmental impacts of IBLI on local rangeland health (RH).

Background:
IBLI is an insurance product which is sold or provided for free to herders in East Africa to reduce the risks of poverty from drought-related livestock mortality. IBLI launched in January 2010 as a pilot in a northern Kenyan county and is now available across Kenya and in southern Ethiopia. While the effects of IBLI on the behavior and well-being of herders have been thoroughly investigated, the environmental impacts of IBLI have not yet been closely examined. Productive, sustainable rangelands are critical for the stability and vitality of local pastoral communities. Thus, if rangeland conditions were to decline over time, livestock mortality and human migration to urban areas may increase, weakening informal and cultural institutions, and ultimately threatening the viability of traditional pastoralist lifestyles. Additionally, healthy livestock herds are critical to the economic health of pastoral communities. If IBLI inadvertently promotes overuse of rangelands, the herders' short-term gains from insurance coverage may be offset by the long-term environmental damage that ultimately manifests in increased herd mortality. Therefore, identifying IBLI's potential environmental impacts and adequately addressing them can be crucial to preserving the long-term socio-economic stability of these communities.

Proposed Work:
I propose to assist Professor Chris Barrett with the second phase of his rangeland health project. Professor Barrett's project examines the effects of IBLI on the environmental health of local rangelands in the pastoral communities of southern Ethiopia and Kenya. The project seeks to determine the environmental impact of IBLI on local RH. The RH project is divided into two phases. Phase I, which is quite advanced, consists of building a data set of RH indicators from 10 years before and 10 years after the introduction of IBLI in the areas of interest. Phase II uses the resulting data as dependent variables in a quantitative impact assessment of the environmental impacts of IBLI in the areas of interest using predictive models. I would assist with the data visualization and analysis in the final steps of IBLI impact assessment and in the presentation of findings to research, policy, and community audiences.

Objectives:
The overall project has four objectives.
The first objective is to ensure that the model is able to accurately estimate RH in the areas of interest. While initial results suggest the model performs well, further modifications can improve the accuracy and validity of predictive results.

The second objective is to use statistical techniques to create an index that describes RH. This index can subsequently be used by scientists seeking to quantify RH in other regions with access to similar data.

The third objective is to answer the following two questions:

1) What are the pre- and post-IBLI trends in RH within the study areas?

2) Are observed changes over the pre- and post-IBLI periods indicative of improving or declining rangeland conditions, and are observed changes from baseline reflective of rapid- or slow-onset change dynamics?

Answers to these two questions will inform the isolation of pre-existing trends from the causal effects of IBLI on RH, a critical part of the IBLI impact assessment.

The fourth and ultimate objective of the project is to use the results from the preceding steps to estimate the impact of IBLI on RH over time, controlling for underlying RH trends as assessed in the third step. The past success of IBLI encourages governments, international development organizations, and financial institutions to explore expanding to regions where it is not currently available (e.g., the Sahel of west Africa, southern Africa, and parts of central Asia). This final step can therefore help these organizations and governments interested in introducing and upscaling IBLI offerings to make informed decisions based on the environmental consequences of the product.

Stakeholders:

This interdisciplinary project is being carried out with range scientists, remote sensing experts, and economists from the International Livestock Research Institute (ILRI). ILRI is co-hosted by Kenya and Ethiopia and is part of the CGIAR international network of agricultural research centers. ILRI seeks to improve food and nutritional security and to reduce poverty in developing countries through research for efficient, safe, and sustainable use of livestock. Scientists from ILRI are involved in key roles such as data gathering and classification, facilitating meetings with other stakeholders, and verifying the accuracy of RH estimates generated by the model.