Title
An Evaluation of Agricultural Investments and Programs in Sub-Saharan Africa: A Review

Registration
This protocol has not been registered. However, the protocol will be published in VTechWorks (https://vtechworks.lib.vt.edu/), a publicly available database for Virginia Tech Scholarship.

Authors
Gabrielle Smith
Graduate Research Assistant, Department of Genetics, Bioinformatics, and Computational Biology, Virginia Tech, Blacksburg VA, 24061
Email: gabrils@vt.edu

Cassidy Rist, DVM, MPH, DACVPM
Assistant Professor, Department of Population Health Sciences, Virginia-Maryland College of Veterinary Medicine, Virginia Tech, Blacksburg, VA 24061
Tel: 540-231-3373; Email: crist6@vt.edu

Contributions
GS and CR are first and second reviewers respectively. GS is leading protocol development and analysis. Both authors will contribute to data interpretation and article drafts.

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INTRODUCTION

Rationale

Undernourishment caused by hunger can have devastating impacts on communities, individuals, and children under 5 in particular; it can lead to compromised immune systems, growth stunting, decreased cognitive abilities, and a host of other disorders[1]. Steady agricultural production is crucial to the reduction of undernourishment through poverty alleviation and improved food security[2–6]. In fact, agricultural development has shown to be highly effective in improving food security and nutrition, even more so than solely increasing the income of the poorest populations [7]. Despite this well documented knowledge, the number of undernourished people in the world has risen over the last few years and sustainable agricultural productivity has stagnated [8,9].

While the density of populations affected by undernourishment varies regionally, no region has been as consistently and proportionately affected by this as Sub-Saharan Africa (SSA)[8]. This high prevalence of undernourishment is attributed to a lack of sustainable solutions to food insecurity[10]. In order to address this issue, there have been a number of calls to action for multisectoral and evidence-based policy focused on improving agricultural development and nutritional intake[11–13]. While this call has seemingly been answered by agricultural investments and programs (AIPs) in the form of food fortification programs, cash transfers, and agricultural assistance and aid, the recent increase in undernourished individuals indicates a lack of efficacy.

Although there is substantial research dedicated to evaluating expected solutions to undernourishment in SSA, investigating the efficacy of these solutions needs to be given the same degree of concern in order to adequately combat this issue. The addition of efficacy in AIP evaluation not only provides an evidence base for undernourishment solutions, but also provides a distinction between expected and proven solutions. Thus, it is imperative to evaluate the efficacy of AIPs with this intention in tandem with their implementation. While there may be countless solutions to undernourishment in theory, resources are finite and should be dedicated to solutions with demonstrated health impacts (e.g. improved nutrient intakes, increased dietary diversity, decreased stunting, etc.). With this knowledge of demonstrated solutions, various AIPs can be more effectively prioritized.

This review will examine data indicating any evaluation of AIPs based on various health and nutritional outcomes in SSA. More notably, this review will identify the current evidence-base for which AIPs have demonstrated impacts on the reduction of undernourishment or other negative health outcomes as well as summarize the indicators used in impact evaluation. The findings from this review can be used to determine the strength of evidence in support of different AIPs in SSA, and identify any inconsistencies in the outcome measures used to determine AIP impact on undernourishment. The achievement of these goals could be instrumental in designing and selecting AIPs to achieve efficient distribution of resources designated for fighting hunger and undernourishment.

Objectives

1. To characterize the outcome measures and indicators used to evaluate AIPs
2. To examine objective demonstrations of AIPs on the state of human health and nutrition in SSA
3. To examine the current evidence-base for policy formed by AIP outcomes in SSA

METHODS

Eligibility Criteria

Due to the related nature of the objectives, the eligibility criteria will remain the same between them. The publications must fit the following criteria:

1. Must be a primary source written in English
2. Must have been published after 1980
3. Must make some quantitative measure of a real or predicted health, nutrition, or food security output
4. The results section must be in reference to, or a direct result of, some agricultural investment or program
5. The results must be in relation to, or be a direct outcome of, individuals located in a Sub-Saharan African country

Additionally, the following criteria result in ineligibility for the publications:

1. Solely qualitative analyses
2. Results that refer to or result from international trade
3. Results that refer to or result from trade policy in the place of agricultural investments or programs

Information Sources

The search will apply the same search terms across eight databases:

- AGRICOLA from ProQuest with Virginia Tech Access
- Agriculture and Environmental Science Databases from ProQuest with Virginia Tech Access
- Agriculture, Life, and Natural Sciences Databases from ProQuest with Virginia Tech Access
- AgEcon Search from The University of Minnesota with Virginia Tech Access
- AGRIS
- Animal Health and Production Compendium from CABI
- CAB Abstracts from CAB Direct
- Gale Academic OneFile

Search Strategy

The following search terms were used across all the databases and were all identified within the abstract of the publications:

AB(Africa OR SSA OR "Sub-Saharan Africa") AND AB(policy OR law OR regulation OR enforc* OR program* OR investment OR infrastructur* OR fiscal OR economic*) AND AB(nutrition OR health OR "One Health" OR "public health" OR "animal health") AND AB(livestock OR agricultur* OR animal OR food)

Additionally, within each database, search results were limited to publication dates between 1980 and May 26, 2020.

Study Records

Data Management:
The publications will be recorded and managed using Mendeley, a reference management software (https://www.mendeley.com).

Selection Process:
GS and CR will be the primary and secondary reviewers respectively. The resulting publications will be reviewed by title and abstract for inclusion. A full review will be performed for publications with uncertain eligibility from title and abstract alone. Additionally, publications for which the reviewers disagree on eligibility will be subject to a full review and discussed until a consensus is met. Relevant review articles returned in the search results will have their bibliographies reviewed for further relevant sources missed by the initial literature search.

Data Items

The following data items will be extracted:

- Year of publication
- Country in which the data was extracted or the research was performed
- AIP(s) involved
- The measure or metric used to determine the health or nutritional impact
- The overall impact of the AIP on the metric/measure of health or nutrition
- Policy implications or call to action

Data Synthesis

The data will be compiled into a summary table along with a written narrative synthesis of findings.

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