

Pursuing the co-benefits for Health and Environments through food system change: a compendium of research ideas from early career researchers



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Acronyms

CARICOM	Caribbean Community – grouping of 20 countries
CIAT	International Center for Tropical Agriculture
CoP	Community of Practice
DBM	Double Burden of Malnutrition
DEAT	Department of Environmental Affairs and Tourism
EcoHealth	Ecosystems and Human Health (past IDRC program)
ECOSOC	United Nations Economic and Social Council
EIGE	European Institute for Gender Equality
FAN	Food and Nutrition/Food for Change Project
FAO	Food and Agricultural Organisation of the United Nations
FAQs	Frequently Asked Questions
GCRF-AFRICAP	Global Challenges Research Fund-Agricultural and Food systems Resilience: Increasing Capacity & Advising Policy
GHG	Greenhouse Gases
HLPE	High Level Panel of Experts
HLPEFSN	High-Level Panel of Experts on Food Security and Nutrition
IDP	Integrated Development Plan
IDRC	International Development Research Centre
IPES-Food	International Panel of Experts on Sustainable Food Systems
LMICs	Low- and Middle-Incomes Countries
ML	Machine Learning
NCDs	Non-Communicable Diseases
NRC	National Research Council
OECD	Organization for Economic Co-operation and Development
RRI	Rights and Resources Initiative
SDG	Sustainable Development Goals
TAG	Technical Advisory Group
UKZN-SHEFS	University of KwaZulu-Natal Sustainable Healthy Environment Food System project
U of T	University of Toronto

1. Introduction

Over the past five decades, global food systems and human dietary patterns have changed substantially. Transitions to unhealthy and unsustainable diets are not only increasing the burden of obesity and diet-related non-communicable diseases (NCDs) such as diabetes and certain cancers but are also contributing to environmental degradation and climate change. Low- and middle-income countries (LMICs) are disproportionately affected with more rapidly rising rates of non-communicable diseases including in younger populations that further deteriorate health and strain economic resources for all.

Unhealthy diets are the largest contributor to the global burden of NCDs. Globally, more than 2 billion people are overweight or obese –of which 41 million are children under the age of five years. Obesity alone accounts for 4 million deaths annually and costs the world about 2.8% of Gross Domestic Product. At the same time, about 820 million people remain undernourished, 150 million children are stunted, and more than 2 billion people are micronutrient deficient.

Not only are global diets unhealthy, they are also unsustainable. The food systems that produce much of what the world consumes are one of the single largest cause of global environmental change. For example, agriculture occupies about 40% of global land, and food production is responsible for up to 30% of global greenhouse-gas emissions. The unsustainable nature of global food systems and their impact on climate change create a vicious cycle. Unsustainable food systems contribute to climate change which over time will affect food production and ultimately human health. The effects of this vicious cycle are already being felt most severely across LMICs, specifically in fragile states and climate change hotspots within these countries.

To date, global actions to this challenge have been slow, and insufficient to promote population health and equity, and the environments which sustain them. For instance, a recent scan¹ of academic and grey literature identified 105 funders in the food systems research arena focused on the co-benefits of health and environments. That said, there is growing interest in supporting research and interventions to tackle this challenge. At the same time, there is an evident increase in overall publications relating to co-benefits across academic journals from 9 in 2017 to 26 in 2020, without any particular trend observed from the journal source^{ibid}. Indeed, promising transformative interventions and opportunities can be found within LMICs where the impacts of climate change are most apparent. The scale and ambition of the challenge requires LMICs to fully participate in and shape these efforts. Ultimately, a global transition to a healthy, equitable and sustainable food system must involve local representation, Southern leadership and research-driven and contextually sensitive solutions, which are meaningful, feasible and sustainable in LMIC contexts.

¹ This preliminary scan was conducted between July 5th and August 12th 2021 using SCOPUS electronic database and grey literature, where funder information was screened and categorized by relevance, location, target geographical region and primary research topic area.

Novel ideas are needed to address the interlinked challenges of food, nutrition and climate change by promoting shifts towards healthier and sustainable food systems. There is also an important need to support LMIC researchers, policy-makers, and civil society actors to understand how to promote environmentally sustainable and healthy food systems in LMICs. Canada's International Development Research Centre (IDRC), in collaboration with the University of Toronto (U of T) 's Dalla Lana School of Public Health and its Centre for Global Health, launched a new Research Ideas Competition in October 2020. The goal of the competition was to strengthen policy interventions, population health, environmental sustainability, and equity in LMICs by inspiring novel research ideas in the emerging area of co-benefits for health and environments through food systems change.

Building this research ideas competition around capacity building and engagement, IDRC and U of T were able to facilitate the development of novel ideas in the vital, interlinked areas of nutrition and climate change, and provide lessons for similar, future initiatives and research in these areas. As such, the following audiences might find this compendium useful - students interested in food systems, researchers across disciplines, research funders, policy makers, and practitioners.

2. Overview of the research competition

1) Call for Research Ideas: The call for research ideas (see *Appendices 1* and *2* for English and French versions respectively) was promoted via U of T and IDRC websites and social media to potential competition applicants, partners, decision-makers, donors, and research experts interested in being peer reviewers. The overall application process went well as highlighted by one awardee: *“from the beginning, IDRC has been excellent in communicating the process and what to expect in the next weeks or so: this includes the application process.”* Nevertheless, an orientation session on the co-benefits, being such a new concept to many early career researchers, may have been beneficial for the applicants. The Frequently-Asked-Questions (FAQs) developed for this call is provided in *Appendix 3*.

2) Screening of applicants: Ninety-two doctoral students and postdoctoral fellows enrolled in a doctoral degree or post-doctoral fellowship program at a recognized university, all of whom were citizens of LMICs, Canadians, or permanent residents of Canada applied to this Competition. Close to half (48%) applied from an institution based in Africa and one third from one based in North America. The majority (72%) of applicants were doctoral students. A wide range of plausible and important applications were received on food systems research focusing either on health or agri-food; yet only a handful explored the co-benefits for health and environments with their idea.

3) Peer Review: The primary applicants for the call went through a two-stage selection and peer review process. Thirty-five peer reviewers from a variety of geographic regions and disciplines were selected, including nutrition, health, engineering, agriculture, environment, computer science, gender and other relevant areas of research.

4) Awardee Identification: Seven awardees (see *Appendix 4*), including four PhD students and three post-doctoral fellows, were selected. Awardee identification was based on a strong pool of applicants, consideration of health and environmental co-benefits, and the available funding envelope. An interdisciplinary peer-review committee ranked proposals following a rigorous and fair peer review process and using the published criteria of the Research Ideas Competition (see *Call for Research Ideas* in *Appendix 1*).

5) Forum for capacity building: Two engagement workshops were organized by U of T and IDRC to help awardees further develop their ideas in varied areas, including scaling science, gender and equity integration, and influencing and engaging policymakers. As one awardee pointed out, *“the workshops helped to get to know what the other awardees were working on and the state of their reflections. I also greatly learned from the presentations from the various experts. As someone who is a bit outside the field of public health and environmental studies, these workshops helped expand my knowledge and understanding of these disciplines”*.

6) Compendium Development: This compendium captured the outcomes and learnings of the Competition, unifying the strengthened research ideas through the lens of co-benefits to Health and Environments through food system change.

Technical guidelines, including key references on co-benefits, were provided to awardees to help them elaborate their ideas. It was found that *“the technical guidelines were well thought out and encouraged critical thinking beyond the [awardees’] original research proposal”*; with another awardee saying that *“I am now in a place where I can conceptualise my idea beyond my discipline and seek collaborators”*. Nonetheless, having an in-depth session on co-benefits with the compendium’s technical guidelines shared beforehand would have been helpful for the awardees to discuss the links between each research idea and the co-benefits since *“the rigorous quantification and valuation of co-benefits are extremely context dependent[;] often projects cannot predict these upfront, so understanding how to consider these during a project life cycle would have been beneficial.”*

2.1 Check out some more awardees’ reflections on the competition

Tebogo: *“Despite growing attention to the new concept of systems thinking, there is a lack of resources to guide the implementation process practically. The IDRC training and compendium guidelines enabled me to pragmatically reflect on some challenging implications of intersections in food systems, such as navigating the conflicts between the co-benefits”*.

Ranaivo: *“The training about gender integration, equity issues, and research impact have been very helpful for strengthening the proposal. Technical suggestions during the review of the proposal have also been useful. It was nice that all the resources can be accessed even after the workshop. The technical guidelines for the compendium were also clear. Bold ideas were encouraged for the competition. Bold ideas however are often expensive. I appreciate very much the funding provided by IDRC. But it would really help if there were more information or guidelines about how to get more financial resources within or outside IDRC. It would have been really good if there were opportunities to be in touch or to network with potential funders.”*

Kanchana: *“The resources provided through workshop presentations and email were helpful in understanding tasks given. They were also useful in broadening my knowledge. Each mentorship session was packed with new knowledge and broadened my understanding of the research project I proposed.”*

Chuma: *“I will forever appreciate this process of mentorship as it has helped me to grow beyond what I had ever dreamt about. It has opened my eyes to dream bigger and just dare to act. For the experts that were involved in the process, I say ‘Thank you!’”*

3. Research ideas on the co-benefits of Health and Environment

The following research ideas are listed in no particular order:

Kanchana Wickramasinghe focuses on health outcomes at the intersection of food systems, environment (including climate change) and household economics using data from Sri Lanka and the use of a machine learning approach.

Bianca Carducci describes a holistic narrative of change to food systems by conducting in-depth analyses of food system drivers and determinants on the double burden of malnutrition in children and adolescents in LMICs.

Ranaivo Andriarilala Rasolofoson examines how community forest conservation and management may leverage nutrition benefits provided by nutrition programs to address several underlying determinants of undernutrition lying on the pathways between forests and nutritional status, using the case of Madagascar.

Chuma Banji Chinzila aims to understand the drivers of consumer behaviour to identify levers of change that will foster development of sustainable healthy food systems, focusing on the South African context.

Tebogo Thandie Leepile examines the use of experience-based reflections (using focus group discussions and in-depth interviews) to explore the potential co-benefits of leveraging the food sovereignty and food security discourses towards sustainable and equitable food systems in Botswana and South Africa.

David Smith argues for better understanding the potential co-benefits of inclusive governance for Latin American and Caribbean urban food markets, as well as the drivers and barriers for its generation and maintenance during the COVID-19 pandemic.

Jenny Melo-Velasco describes an evidence-informed "smart-toolbox" aimed at policymakers and practitioners working in LMICs to facilitate navigating the broad repertoire of available resources promoting healthy, equitable, and sustainable food systems, and making an informed decision on its potential adoption in local contexts.

INTERLINKAGES BETWEEN FOOD SYSTEMS, HEALTH RISKS AND ENVIRONMENTAL DIMENSIONS IN SRI LANKA: A MACHINE LEARNING APPROACH

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Food systems have become more complex due to increasing urbanization, income growth and globalization (1). Further, the COVID-19 pandemic has led to increase vulnerabilities on food systems and associated components such as food production and food insecurity among vulnerable communities. Comprehensive understanding of potential co-benefits is important in generating multiple benefits from post-COVID policy interventions. The proposed research intends to map the connections between important components of food systems, health and environment systems and their outcomes using a quantitative approach.

Studies point out the need for policy level changes to reduce the premature NCD mortality in Sri Lanka, which has been showing a notable increase (2). Specific behavioural risk factors such as physical activities, dietary habits, smoking, alcohol consumption and obesity (3) and urbanicity (4) have found to have significant impacts on prevalence of NCDs. Further Sri Lanka is identified as a highly vulnerable country to the impacts of climate change and agriculture sector is particularly vulnerable climate impacts (5).

Alignment of co-benefits at the intersection of Health and Environments

The proposed study will focus on health outcomes at the intersection of food systems, environment (including climate change) and household economics using data from Sri Lanka. The health dimension will be mainly addressed via the NCDs which have a strong relationship with several facets in the food systems in low- and middle-income countries. The impacts due to NCDs are particularly high in South Asia (6). Other diseases will also be considered depending on their significance in the interlinkages between health, environment, and food systems.

More specifically, the study will attempt to categorize the households based on health risks and to predict such risks using variables that cover the dimensions of food systems (such as production and consumption), environmental conditions, and climate change vulnerabilities. The study will deviate from commonly available descriptive approaches to produce quantitative estimates by accommodating individual, household and district level data from Sri Lanka.

Our aim goes beyond the objective of the econometric approaches which aim at estimation of parameters that underlie the relationship between dependent and independent variables. From a policy perspective, it is highly important to have empirical information on risk prediction in relation to health, food systems and environmental interlinkages.

Relevant conceptual theories, methodological tools, frameworks, approaches, gender and equity considerations

Spotlight on references:

Brouwer ID, et al. Food systems everywhere: Improving relevance in practice. *Global Food Security* 2020;26,100398.

Parsons K, Hawkes C. Connecting Food Systems for Co-Benefits: How Can Food Systems Combine Diet-Related Health with Environmental and Economic Policy Goals? Policy Brief 31; Denmark: World Health Organisation (WHO Regional Office for Europe) 2018.

- Initial analysis of the study primarily based on the conceptual framework presented in Brouwer et al. (7) adapted from HLPE (8) and the “A vision for food systems with co-benefits” framework developed by Parsons & Hawkes (9). These frameworks provide the basis for identifying specific variables and indicators for the quantitative assessment.
- Machine learning (ML) approach for predicting health risks based on the food system and environmental dimensions using individual, household and district level data from Sri Lanka. ML is a versatile approach that has direct policy applications (10).

We will employ supervised ML techniques to understand the linkages between the food systems, health outcomes, environmental factors, and climate change in Sri Lanka. The analysis will involve classification of households to several categories, based on the prevalence of NCDs among the household members. A household level index will be developed based on prevalence of NCDs. The index is used in clustering the households based on NCD prevalence. The next step will involve feeding the socio-economic, demographic, food-system related aspects and environmental factors into the model and assess how accurately the model can classify the households into different categories based on NCD prevalence. The model will be then trained to get an accurate prediction, so that it can be used to identify the vulnerable households. Interestingly, the model will also be used to detect the potential households who are at a risk.

The quantitative analysis helps in understanding the significant interlinkages between health, environment, and food systems at household level. The interlinkages can be used in identifying the potential avenues for creating co-benefits through policy interventions. More specifically, the findings of the study will be helpful in addressing the issues in health outcomes in terms of food system and environmental changes.

The proposed approach provides the flexibility to carry out the analysis for different segments of population. It is intended to use data from the Household Income and Expenditure Survey conducted by the Department of Census and Statistics of Sri Lanka. The survey is carried out usually once in three years and the study will use data from the latest round of survey conducted in 2018. The Survey identifies the gender, education status, age, health outcomes, income, etc. at individual level. This will provide an opportunity to understand the gender-based differences regarding health outcomes. In addition, the analysis can potentially be extended to perform detailed analysis based on other socio-economic groups. The supervised ML models will be first trained using the historical dataset using pre-identified target variable and the features. An accurate model which can predict the target reasonably well will be identified by employing rigorous validation techniques.

Available techniques that could reduce overfitting of machine learning models will be also incorporated into modelling. Moreover, qualitative variables such as gender and other social or political variables can be used as inputs in these models, thus we could minimise any biases that could creep into the outcome. Furthermore, we are planning to adopt a range of ML algorithms, particularly the deep learning models, so that any inherent biases exist in the algorithms can be minimised.

These socio-economic groups may be based on individual/household income (poverty groups), employment categories, occupation types, sectors (rural and urban), districts, agricultural dependence, etc. Such detailed analysis will help in understanding the differential behaviours of such groups at the interlinkages between health, environment, and food systems. Our quantitative findings will thus provide an indication about the level of potential co-benefits among the identified groups.

Measurement of impact

Spotlight on references:

Mayrhofer JP, Gupta J. The science and politics of co-benefits in climate policy. *Environmental Science & Policy* 2016;57,22-30.

Cohen B, et al. Co-benefits and trade-offs of climate change mitigation actions and the Sustainable Development Goals. *Sustainable Production and Consumption* 2021;26,805-813.

The derivation of specific indicators for measuring the co-benefits will be based on the significant inter-linkages that will be identified through ML analysis. Potential indicators may include:

- Disease prevalence by gender, socio-economic (income, employment etc.), sector (rural and urban), geographic, and other important categories;
- Proportion of sustainable food production incorporating the aspects of chemical usage, subsistence food production;
- Environmental outcomes and climate adaptation indicators including natural disaster impacts, housing characteristics, dependence on natural resources (land, forests, fisheries), household energy consumption;
- Socio-economic outcomes including level of employment, income diversification, education level, indebtedness

Interestingly, the idea of co-benefits includes political weight in its definition, application and use (11). As highlighted by Cohen *et al.* (12), the co-benefits approach has the potential to encourage collaborative action of stakeholders with regard to climate change interventions. This aspect can be effectively extended in influencing the stakeholders regarding promoting health and environmental co-benefits regarding food systems. The findings of the study will be mainly used to influence policy makers in an array of development areas including health and nutrition, agriculture, climate change, natural resource management, environment, and social welfare. The findings will also be useful for development agencies, non-governmental organizations, and donors in assessing the potential impacts of their development interventions.

Challenges/barriers and knowledge gaps impeding shifts towards healthier and sustainable food systems

Spotlight on references:

Berrang-Ford L, et al. Systematic mapping of global research on climate and health: a machine learning review. *The Lancet Planetary Health* 2021;5(8),e514-e525.

Athey S. The impact of machine learning on economics. In Agrawal A, Gans J, Goldfarb A, editors. *The economics of artificial intelligence: An agenda*. US:University of Chicago Press; 2018.p. 507-547.

Storm H, et al. Machine learning in agricultural and applied economics. *European Review of Agricultural Economics* 2020; 47(3),849-892.

The idea of co-benefits has been receiving an increasing attention in previous work that aims at reconciling environment and developmental goals (11). Our review of literature regarding health, environment and food systems indicates that existing studies mostly are qualitative in nature. This creates challenges in understanding the comparative magnitudes of the co-benefits created by specific policy interventions. Further, a review done by Berrang-Ford *et al.* (13) find that the existing literature that focus on climate change and health has paid little attention towards solutions and co-benefits of policy interventions. Brouwer *et al.* (7) points out that the critical trade-offs in food systems and required policy interventions are not sufficiently studied in the literature.

Regarding policy interventions, lack of collaborative efforts among the policy makers and other stakeholders has been a key obstacle in realizing co-benefits. This may be particularly true for low- and middle-income countries and Sri Lanka is no exception.

We intend to apply ML approaches to perform a predictive analysis, which is a novel and growing field in agricultural and applied economics (14). Data-driven model selection is a common characteristic of many machine learning methods. This feature allows development of algorithm that can examine several alternatives and then select the best model (15). Such data-driven modelling techniques allow producing interdisciplinary and holistic solutions to complex issues including socio-ecological issues (16).

A common limitation in ML and other statistical/econometric models is that they are unable to capture some qualitative features that are driving the target variable. Also, there can be overfitting issues in ML models and this can be controlled to some extent by adopting recently developed techniques. As highlighted previously, unlike in econometric models, ML models cannot explicitly estimate responsiveness of different variables in causality analysis. However, in terms of prediction power, ML models are much superior to other standard models. The proposed study also will present a methodological contribution to the literature using ML approaches, by illustrating how household level data can be utilized to understand the complex relationships in food systems and design necessary policy interventions.

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EXPLORING THE DOUBLE BURDEN OF MALNUTRITION IN CHILDREN AND ADOLESCENTS IN LOW- AND MIDDLE- INCOME COUNTRIES THROUGH THE LENS OF THE FOOD ENVIRONMENT: A MIXED-METHODS APPROACH

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Rising rates of food insecurity, with deteriorations in diet quality, micronutrient deficiencies, and other forms of malnutrition, in part stem from fundamental, complex, and dynamic changes in food systems (1-3). Current food systems perpetuate interactions with suboptimal food environments historically shaped by deeply rooted structural, social and environmental inequities, prohibiting equitable access to nutritious and safe foods, and that almost everywhere favour exposure to inexpensive, nutrient-poor, fast-food, convenience foods high in fat, sugar and/or salt, and sugar-sweetened beverages (3-5). For children and adolescents, this environmental exposure leads to an increased reliance and greater preference for these types of foods, as well as poorer eating patterns such as increased snacking and eating-away-from-home (6). Together, this has contributed to the rising nutrition transition and double burden of malnutrition (DBM), especially in LMICs (7).

Alignment of co-benefits at the intersection of Health and Environments

Through a series of country case studies, this project aims to generate a holistic narrative of change to food systems by conducting in-depth analyses of food system drivers and determinants on the DBM in children and adolescents (0-19 years) in LMICs. Countries will be selected based on optimal (positive outliers) or suboptimal (negative outliers) progress in reducing the DBM in children and adolescents.

Drawing on interdisciplinary and intersectoral expertise, this proposal will leverage effective research partnerships and engagement with experts at all stages, to triangulate and corroborate data through local knowledge generation and dissemination. Further, this project seeks to develop a composite score to monitor performance across the global food system and related systems (health, macroeconomic and geopolitical, environment and climate, social protection, education and water, and sanitation and hygiene systems) to help identify potential synergies and to reveal trade-offs between economic, environmental and social sustainability. As there are no one-size-fits-all solutions, country-level experiences provide illustrative examples of what it takes – in very practical and innovative ways – to transform food systems to reduce the DBM. Findings from each case study will allow for the development of comprehensive policies aimed at both the food and natural environments, resulting in a more coordinated governance of food and co-benefits to human health and the environment.

Relevant conceptual theories, methodological tools, frameworks, approaches, gender and equity considerations

Spotlight on references:

High Level Panel of Experts on Food Security and Nutrition, Nutrition of the Committee on World Food Security. Nutrition and Food systems. Rome: FAO; 2017 [cited 2021 09 01]. Available from: <https://www.fao.org/policy-support/tools-and-publications/resources-details/en/c/1155796/>

Carter A *et al.* A framework for identifying and learning from countries that demonstrated exemplary performance in improving health outcomes and systems. *BMJ Glob Health* 2020; 5(12)

Conceptually: the High Level Panel of Experts Food Security and Nutrition Framework will be used as guidance for both phases of work (8). This framework illustrates the influence of food system drivers (structural factors including demographic change, political and economic environment, technological advances, natural resource management and social and cultural norms), determinants (processes and conditions including food supply chains and food environments), influencers (individual factors including behaviours) and interactions (dynamic feedback loops) on the diets of children and adolescents.

Methodologically: the Exemplars in Global Health approach, developed by Gates Ventures (9) is an evidence-based framework which identifies exemplar countries or 'positive outliers' (i.e., those that reduced a specific health outcome prevalence beyond the projected gains associated with general economic growth). This approach employs diverse and exhaustive methodologies (descriptive and causal quantitative analyses of survey datasets, administrative data and ecological variables; qualitative data collection and analyses; policy and program analyses; and systematic literature reviews) (9, 10). Taken together, these tools will provide the opportunity to re-evaluate how to measure food system drivers, which drivers/indicators are most important and deduce feedback loops that can create compounding impacts on malnutrition.

Given the systemic inequities within food systems, this project will consider a diverse range of LMICs in country case study selection, which represent vulnerable and marginalized populations (e.g., migrant, internally displaced, refugee, and urban slum child and adolescents) in order to create meaningful impact in reducing the DBM. Women tend to be overrepresented among the poorest and constitute a large proportion of the informal food sector labor force with food systems (11). Furthermore, women, young children and adolescents are also the most nutritionally vulnerable segments of the population given their higher nutrient needs, which puts them particularly at risk of under- and over-nutrition in times of crises. Therefore, we will conduct gender-specific descriptive and causal analyses, while ensuring adequate representation of women in qualitative interviews and stakeholder consultations in country-level activities.

Measurement of impact

This methodologically rigorous study will fill a global evidence gap in the current understanding of food systems in various ethnically diverse and dynamic LMICs, and how it is interlinked to the double burden of malnutrition in children and adolescents, mediated by diet. Measuring impact will entail:

- Identifying synergies and trade-offs within food systems and public health nutrition, as well as related systems within each country.

- Facilitating an adaptive process of system changes, aligned with national strategies and combined with contextual policy innovations. This process needs to be inclusive, with particular attention paid to vulnerable groups such as women, who make up a large proportion of the informal food sector labor force.
- Tracking a set of core national and subnational food system and related system indicators to benchmark progress over time to inform decision-making of policymakers, implementers and funders.

Challenges/barriers and knowledge gaps impeding shifts towards healthier and sustainable food systems

As this proposal relies on both primary and secondary food systems data, various limitations exist. Often, secondary data are not always available or as robust as the methodology and technical advisors dictate. In cases of missing or low-quality data, we will rely on proxies whenever possible. Furthermore, there are ethical considerations in conducting primary data (i.e., multifaceted interviews and narratives) to produce a description of experiences (12). This is particularly true when highly sensitive issues are concerned such as food accessibility and affordability in vulnerable populations. Thus, building trust and confidentiality with the in-country partners and the communities, knowing the local culture and micropolitics, and detecting our own biases as we engage in the research process, will be important steps in collecting valid and reliable data (12). Furthermore, there are potential challenges in stakeholder uptake and coordination. To mitigate this, we will convene a technical advisory group (TAG) at the outset of the project. Their role is critical to ensure rigour, offer new ideas and avenues for exploration, and facilitate connections with in-country research partners and dissemination partners. TAG members are identified by project teams through self-nomination or through snowball sampling approaches, whereby experts are recommended by others in the field. The TAG is continuously engaged through all aspects of the project, including methods and inferences, strengths and limitations, prior knowledge, discourse on dissemination and partnerships.

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NUTRITION UPGRADE TO FOREST CONSERVATION

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The COVID-19 pandemic has amplified existing nutritional challenges. It has put into focus unsustainable food and nutrition policies and practices that are not only non-resilient to shocks, but also increase the likelihood of future shocks. The impacts of unsustainable food policies and practices on natural systems (e.g., forests, climate) feed back to affect food production and ultimately food and nutrition security. To break the feedback loop, recovery from the COVID-19 crisis should be designed to “build back better” (1). That is, doing more than getting livelihoods back to normal by designing policies or interventions that reduce the likelihood of future shocks, strengthen resilience to them when they occur, and address pre-existing structural inequities (1). This can be achieved by integrating environmental, food and nutrition interventions to ensure that nutritional outcomes are not delivered at the expense of the environment. Forest conservation interventions offer a unique opportunity as nutrition-sensitive interventions.

Alignment of nutrition and environment co-benefits

Forests provide ecosystem services that support resilience of vulnerable forest dependent households to shocks, meaning the ability of these households to withstand and bounce back from shocks. Examples of such services include the provision of forest foods and livelihoods from forest products (2). Other forest ecosystem services reduce the risks of future shocks (e.g., climate change mitigation and regulation of zoonotic and vector-borne diseases) (3-4). However, forests are under threat in large part due to agricultural expansion driven by increasing food demand (5). There is thus a need to develop interventions that safeguard forests while meeting human nutritional needs.

Forest conservation is a potential nutrition-sensitive intervention that can deliver conservation and nutritional co-benefits. Forest conservation can address several underlying determinants of undernutrition lying on the pathways between forests and nutritional status, including the supply of forest food products, income, habitat for pollinators, diarrheal disease, dietary diversity, and women’s time allocation to forest-related livelihood activities (e.g., firewood collection) that in turn affects their time for nutrition-related activities (e.g., food preparation, child feeding behavior) (6). Forests have been associated with reduced prevalence of stunting and anemia (6-7). Forest conservation interventions are often located where rates of undernutrition are high (6). Increasing the nutrition sensitivity of forest conservation will therefore provide nutritional benefits for some of the world’s vulnerable communities.

Relevant conceptual theories, methodological tools, frameworks, approaches, gender and equity considerations

Spotlight on references:

Ruel MT, Alderman H. Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? *Lancet* 2013;382:536–551.

Rasolofoson RA et al. Forest conservation: a potential nutrition-sensitive intervention in low- and middle-income countries. *Frontiers in Sustainable Food Systems* 2020;4,20.

To increase their nutrition sensitivity, nutrition-sensitive interventions are used as delivery platforms for nutrition specific interventions (e.g., food supplements, fortification) that address the immediate causes of undernutrition (e.g., nutrient intake) (8). I propose to use community forest management, a widespread forest conservation intervention in developing countries (9), as a platform to deliver community nutrition programs. Both community forest management and community nutrition programs involve local communities. By offering a community-based delivery platform to nutrition programs, community forest management will increase the likelihood of success of nutrition programs at delivering nutritional outcomes. Community forest management, in turn, can leverage nutrition benefits provided by nutrition programs to improve its local acceptability.

Community nutrition activities will target undernourished women and children in community managed forest sites in Madagascar. Women and children are often vulnerable to undernutrition in low- and middle-income countries (10). In these countries, women are also primary caregivers and prepare food for their families. Community nutrition activities will focus on community kitchens, which are community nutrition programs that not only address food and nutrition insecurity but also empower women by the varieties of activities that the programs can accommodate, such as nutrition education, development of health eating habits, cooking, agricultural and budgeting skills (11-13).

Measurement of impact

Spotlight on references:

Iacovou M, Pattieson DC, Truby H, Palermo C. Social health and nutrition impacts of community kitchens: a systematic review. *Public Health Nutrition* 2012;16:535 – 543

Metrics:

- Nutritional outcomes: anthropometric measurement (e.g., height, weight, age) and blood sampling will be undertaken.
- Nutrition-related intermediary outcomes: women will be interviewed to detect any change in intermediary outcomes, such as income, nutritious food intake, healthy child feeding behavior, food security, and dietary diversity.
- Conservation outcomes: forest cover, restoration or degradation will be monitored
- Conservation-related intermediary outcomes: household surveys will be carried out to examine conservation behavior and the attitude and perception of communities toward community forest management, its activities, and contribution to the well-being of the communities.

The idea proposed here is intended to influence conservation and public health practitioners and scholars. The innovative solution integrating community forest management and community nutrition programs I propose will demonstrate to conservation and public health practitioners the potential synergy between forest conservation and public health nutrition. It will catalyze closer collaboration between these practitioners as such collaboration has the potential to better deliver conservation and nutrition co-benefits than either of these practitioners working on their own.

The serious challenges to global health and nutrition posed by the rapid human transformation of ecosystems have led to increasing number of studies examining the links between ecosystems and human health and nutrition. By testing a solution that integrates environmental and nutrition interventions, the idea presented here can serve as an example that will inspire scholars to go beyond linking ecosystem and human health to developing interventions that safeguard both ecosystem and human health.

Challenges/barriers and knowledge gaps impeding shifts towards healthier and sustainable food systems and barriers

Spotlight on references:

Houghton RA.
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2012;4:597–603.

It is only recently that conservation and public health sectors have started to interact given the public health threats posed by ecosystem degradation. Conservation and public health have evolved separately without much interaction. Consequently, scholars and practitioners in both disciplines have developed different perspectives and approaches that can present challenges in collaborative efforts to address the public health threats posed by ecosystem degradation. The innovative solution integrating forest conservation and nutrition interventions proposed here will provide a platform for close interaction between conservation and public health that will promote mutual understanding and thus improve collaboration between the two disciplines.

A challenge observed in the rare conservation initiatives that intentionally consider human health is the establishment of links between conservation activities and activities designed to improve human health. To link community nutrition programs to community forest management, some specific activities of the nutrition programs will be limited to the women that are members of community forest management associations, while other activities will be open to all target women and children from the wider communities. Activities limited to members of community forest management associations are intended to incentivize these members to continue actively in the associations and non-members to join the associations and its conservation activities. Activities open to women and children from the wider communities are intended to improve their food security and nutritional status and to change or improve the community's attitude toward community forest management.

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CONSUMER BEHAVIOUR FOR SUSTAINABLE HEALTHY DIETS: UNDERSTANDING UNDERLYING MOTIVATIONS FOR CURRENT FOOD PREFERENCES IN SOUTH AFRICA

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Oxfam South Africa (1) describes the status quo in South Africa as a “...sexist, classist and racist economic system that only serves the elite few..., [where] inequalities are deeply rooted in ...colonial history, and are a product of a broken, neoliberal economic path, elite capture, and a focus on male dominated mining, energy and related industries, including finance, that benefit the very rich”. The highlighted inequalities persist and affect the Black African race disproportionately; for instance, in 2015, poverty among Black women was at 20.8% compared to 18.6% (2). The COVID-19 pandemic has worsened inequalities affecting women and children the most (3-5).

Meanwhile, South Africa is still burdened with food insecurity, hunger and malnutrition resulting in nutrition-related non-communicable diseases (NCDs) (6,7). Government priorities reveal a will to address poverty, economic exclusion, sustainable livelihoods, gender inequality (with a focus on GBV against women and children) and health, among other issues (8). So far, policy efforts have been directed towards reducing the incidence of NCDs using tax instruments, improving child and maternal nutrition, and reducing household food insecurity (9-11). This study is located within National priorities and focuses on Black African Women. The aim is to understand drivers of consumer behaviour to identify levers of change that will foster development of sustainable healthy food systems.

Alignment of the co-benefits at the intersection of Health and Environments through food systems change

Given the existing socio-economic and health challenges, various fiscal and non-fiscal policy changes have been implemented aimed at improving livelihoods, access to food and adequate nutritional intake. Government’s poverty, malnutrition, hunger and NCDs eradication strategies have leveraged on multi sectoral cooperation to implement policy programmes (11). Evident are programmes such as the Agro-Ecology and agri-business that cut across food security, livelihoods, environmental sustainability, and research (12) while policy instruments include tax, social grants/assistance; and nutritional programmes (11,13).

Agriculture has therefore been important in meeting socio-economic and health needs (14). Though this is the case, agriculture’s environmental impact is concerning; it uses 80% of South Africa’s total land mass (15) and 62% of surface water (16). On the other hand, the industry wastes up to 30% food every year while 14 million South Africans are affected by hunger (17). Meanwhile, climate change causes crop failures while jobs are lost due to increased mechanisation in the industry; and, small-scale farmers have not been integrated into the mainstream sector (14). Thus, achieving food security and economic needs while using

sustainable production and climate smart techniques, is a challenge that government is faced with currently (14).

Research efforts have been directed towards reducing malnutrition and improving food security through improving food availability, accessibility, and affordability (6). Recent focus has been on understanding food outlets, consumer attitudes to supermarkets, food purchasing patterns, sources of food, and unimportance of urban agriculture (18). This body of research sees income, social protection, and sources of food as critical to achieving food security. Other body of research focuses on improving nutrition through biofortification (19,20); commercialisation of underutilised crops (21,22) while social movements such as food sovereignty are viewed as viable alternatives to current food system (23).

Though research efforts have been made to understand the food system, food security and health outcomes, there is little focus on understanding consumer behaviour. This study seeks to understand how consumer interactions with socio-economic and environmental factors translate to food choices and consequent health-environmental outcomes.

Relevant conceptual theories, methodological tools, frameworks, approaches, gender and equity considerations

Spotlight on references:

Boatema S, Drimie S, Pereira L. Addressing food and nutrition security in South Africa: A review of policy responses since 2002. *African Journal of Agricultural and Resource Economics* 2018;13(3):264-279.

The study takes a social constructivist approach which sees knowledges as contextual, embedded in culture and thus socially and culturally constructed (24,25). In addition, the study adopts the Conceptual framework of food systems for diets and nutrition (26), which identifies food supply chains, food environment and consumer behaviour as determinants of food system outcomes.

A mixed method approach will be adopted and will use the photo voice method as the main data collection tool. Photovoice method will allow participants to share their socially and culturally contextual knowledge about consumer behaviour. Participants will primarily include poor urban residents living in various housing conditions and include a sample from a nutritional programme.

Racial, gender and socio-economic inequalities produce various narratives in South Africa's everyday living. The Black African population group suffer the most inequalities, with Black African women being the worst affected (2). Generally, South African society exhibits high rate of unequal gender relations where women are treated unfairly and lack bargaining power, attributable to patriarchy (27). For instance, women in the workplace are underpaid compared to men and yet they carry the load of caring for their families, communities (28); and, in many cases are solely responsible for the financial needs of the family. Meanwhile, the COVID-19 pandemic has exacerbated gender-based inequalities and violence (4,5,29,30). It has increased vulnerability and desperation of the poor, women, and children. To a large extent, this was demonstrated by the unprecedented July 2021 widespread looting of shops, warehouses, and trucks (31-33). Like the events during the 2020

Spotlight on references:

Willett, *et al.*
Healthy Diets from Sustainable Food Systems: Food Planet Health. 2019. Accessed from www.thelancet.com/commissions/EAT on 18.05.2020.

Modi AT, Mabhaudhi T. Developing a research agenda for promoting underutilised, indigenous and traditional crops. Report to the WATER RESEARCH COMMISSION. WRC Report No. KV 362/16. 2016.

COVID-19 lockdowns, the consequent food and fuel shortages following the July 2021 looting events not only highlight vulnerabilities but also a lack of resilience of the current food system.

In terms of diets, South Africa witnessed a rapid change in consumption behaviour and food choice, post-apartheid (1994 onwards). The diet changes were paralleled by a rapid growth of the big food industry and penetration of supermarkets into previously racially segregated areas (34). Observed changes include increased consumption of: Sugar Sweetened Beverages; highly processed and packaged foods; animal-based products; and reduced vegetable consumption (35). During the same period, diet-related deaths, and illness such as obesity, overweight and malnutrition increased (36,37). Decades later, consumers seem to understand the link between healthy diet and health outcomes, but remain reluctant to consume healthy food (38-40).

While unhealthy food choices pose a threat to human health, they also threaten environmental sustainability (41). High demand for processed foods and animal products, strain human health and the environment through chemicals used in food production (42). On the other hand, demand for natural resources for production, processing, and waste impacts on environmental and human wellbeing (41,42) as exemplified through the climate change phenomenon.

This study will contribute towards understanding the relationship between consumer behaviour and health-environmental outcomes. Of importance are the socio-economic and political contextual factors; how these factors interact to produce observed health-environmental outcomes. The study will focus on poor Black African consumers and their participation in the food system. In addition, the study will highlight gender inequalities in relation to access to sustainable healthy food and participation in the local food system with a view to recommend equitable access to sustainable livelihoods.

Measurement of impact

Spotlight on references:

eThekweni Municipality. Integrated Development Plan, 5-year Plan: 2017/18 to 2021/2022. 2019 http://www.durban.gov.za/City_Government/City_Vision/IDP/Pages/default.aspx

The study will measure impact in terms of influence of research output on future policies and policy programmes. Immediate focus is on the Municipal instruments such as the Integrated Development Plan (IDP), Agro-Ecology and Climate change strategy. The study leverages on existing UKZN-SHEFS (University of KwaZulu-Natal at which the research is based; SHEFS –Sustainable Healthy Food System research project currently underway at the UKZN) relationship with the eThekweni Metropolitan Municipality to influence policy and practice for sustainable healthy food systems with a possibility to upscale. The study identifies the IDP as an entry point. The IDP was established under the Municipal Systems Act 32 of 2000 to set the agenda for local development (43). It provides multisectoral development strategies and programmes to promote development and address challenges and national priority issues, for instance:

- The Agro-Ecology Programme supports all initiatives developed to address food security, hunger, sustainable livelihoods, and environmental sustainability (43).
- Climate Change Strategy falls under the Municipal Climate Protection Programme. It addresses climate change challenges through mitigation and adaptation programmes (44). The strategy identifies 10 priority themes including health, food security, biodiversity, waste, and pollution, among other themes.

Influencing such policy instruments provides an opportunity for maximum impact through co-benefits which are already priorities within these policy instruments.

Challenges/barriers and knowledge gaps that impede shifts towards healthier and sustainable food systems

Spotlight on references:

Roberts S, Shackleton C. Temporal Dynamics and Motivations for Urban Community Food Gardens in Medium-Sized Towns of the Eastern Cape, South Africa. *Land* 2018;7(4):146. doi:10.3390/land7040146

Sedibe, MH, Griffiths PL, Doak CM, Feeley AB, Voorend C, Norris SA. Narratives of urban female adolescents in South Africa: dietary and physical activity practices in an obesogenic environment. *S Afr J Clin Nutr* 2014;27(3):114-119.

As stated previously, food discourses in South Africa have focused on transforming the food environment to improve household food security; and reduce malnutrition. Government efforts have been directed towards reducing incidence of NCDs (9,10), improving nutrition (13) and food security (11). Research such as The Hungry Cities Research has focused on food environments and supply chains in urban areas (6,18). Other research focus has been on developing nutritious food through bio-fortification (19,20); promoting commercialisation and consumption of under-utilised foods (21,22); and micro-food production (45-48).

Despite efforts made in improving nutrition and food security, research highlights a reluctance to consume healthy food and/or to engage in agriculture food production (40). However, Sedibe *et al* (38,39) show that locally grown and indigenous food is considered healthy by urban and rural residents. This presents a dualism in food choice and consumption which persists despite efforts made to improve nutrition and food security. Since nutrition and food security interventions have not been successful in changing consumer behaviour, there's a need for strategies that not only address nutrition and food security needs but also promote healthy food consumption. Global 'diet change' efforts have evolved to include behaviour change along existing efforts to improve nutrition and food security. For instance, the Food and Agriculture Organisation identifies behaviour change as crucial to sustain diet changes (49). South Africa research such as Siwela *et al.* (50), Boatemaa (11) and Govender (20) recommend behaviour change and, education and awareness. However, to effectively change consumer behaviour, it is crucial to understand the drivers of consumer behaviour.

This study seeks to understand consumer behaviour by highlighting the drivers of consumer behaviour. The study will assess food access, preferences, availability, and affordability to understand available sources of food, current food choices and gender participation in the food system. By doing so, the study will highlight inequalities in access to affordable nutritious food, its production, sale, and consumption.

The results of the study will provide a basis for identifying levers of change in consumer behaviour. Co-benefits in policy recommendations will be achieved by considering government priorities and the need for sustainable healthy food systems. Thus, co-benefits will be achieved through implementation of sustainable healthy food systems which also address inequalities within the South African contexts.

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- [dangerous-place-for-women-and-girls-during-covid19-lockdown/](https://www.amnesty.org/en/latest/press-release/2021/02/southern-africa-homes-become-dangerous-place-for-women-and-girls-during-covid19-lockdown/)
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UNDERSTANDING THE INTERSECTIONS BETWEEN FOOD SOVEREIGNTY, FOOD SECURITY, AND THE SUSTAINABILITY OF AFRICA'S FOOD SYSTEMS DURING AND BEYOND COVID-19; A COMPARISON OF BOTSWANA AND SOUTH AFRICA.

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The COVID-19 health crisis and its containment measures have glaringly exposed the interconnected structural weaknesses and vulnerabilities in global food systems, including Africa (1-2). Several development gains have been reversed, and the pandemic has exacerbated the challenges to meet the Sustainable Development Goals' commitments to end world hunger and malnutrition in all its forms by 2030 (3). On the contrary, the situation has yielded unique and vital lessons to inform and guide the rebuilding of resilient and sustainable food systems beyond COVID-19. In particular, globally, there are rising calls for bolder and more ambitious actions to reorient and transform food systems to support human and planetary health (4,5). The purpose of this qualitative inquiry is to foster experience-based reflections (using focus group discussions and in-depth interviews) to explore the potential co-benefits of leveraging the food sovereignty and food security discourses towards sustainable and equitable food systems in Botswana and South Africa.

Food security is defined as the physical, social, and economic access to sufficient, safe, and nutritious foods that meet one's food preferences and dietary needs for an active and healthy lifestyle (6). On the other hand, food sovereignty emphasizes power and people's right to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their food and agriculture systems (7). A sustainable food system is a food system that delivers food security and nutrition for all in such a way that the economic, social, and environmental bases to generate food security and nutrition for future generations are not compromised (8). This project is, therefore, situated at the intersections of these three key concepts. While food security has been widely studied and incorporated into the global and national development agendas (9,10) the food sovereignty discourse is yet to be fully understood within the African context, particularly concerning achieving food security sustainability in food systems.

With its relatively diverse and robust economy, South Africa significantly contributes to the regional food basket and supports the feeding of many neighboring countries including Botswana (11). While regional cooperation is integral to advancing common interests between governments and Africa's development in general, the unprecedented impacts of COVID-19 in South Africa compromised its capacity to support food security efforts both locally and beyond borders (11,12). Most importantly, the disruptions on both food systems highlighted the over-dependency of Botswana on South Africa for the supply of

food commodities such as fruits and vegetables, dairy and dairy products, grains, and some meats (13). In response, Botswana and other countries looked within and leveraged local resources, which fostered questions and dialogue on the potential intersections between food sovereignty, food security, and the sustainability of food systems. In Botswana, the priority is to reduce reliance on external sources by supporting local food systems and promoting local dietary diversity. South Africa, the country with the highest COVID-19 infections in the region, aims to recover and rebuild to feed its citizens and increase the export bill (11,14). This comparative case study is necessary for the analysis and synthesis of parallels between two neighboring countries with strong bilateral relations and common goals.

Alignment of co-benefits and the intersections of Health and Environments through Food Systems Change

Spotlight on references:

Deller SC, Lamie D, Stickel M. Local foods systems and community economic development. *Community Development* 2017;48(5), 612-638. Retrieved from: <https://doi.org/10.1080/15575330.2017.1373136>

Borghini A, Piras N, Serini B. Eating local: A philosophical toolbox. *The Philosophical Quarterly*. 2021 Retrieved from: <https://doi.org/10.1093/pq/pqab039>

Systems thinking, a concept that has gained ground in food systems research recognizes the complexity and interdisciplinary nature of outcomes due to multiple contributing factors and their interactions. The evaluation of the associations between food security and food sovereignty in fostering sustainable food systems presents a unique opportunity to examine multiple issues and co-create practical solutions simultaneously. However, it is imperative to acknowledge that attaining co-benefits is often without conflicts hence the need for integrated, interdisciplinary, and collaborative approaches.

a) Strengthening local economies and livelihoods

Eating close to home can create stable and reliable markets for local food producers and growers, thereby creating jobs and enhancing socio-economic opportunities and livelihoods (15,16). Individual economic emancipation can increase household access to diversified diets and social and health services and is necessary for national development (15).

b) Climate Change Mitigation

South Africa remains a leader in food manufacturing and processing across the region; however, this industry often entails various non-environmentally friendly activities such as transportation and food waste that contribute to greenhouse gases (GHG) emissions and climate change (17,18). Access to external markets can improve dietary diversity; however, it is imperative to prioritize local food systems to mitigate these practices. Moreover, food sovereignty emphasizes using traditional knowledge-oriented agroecological management practices for food production to promote environmental and knowledge sustainability and resilience from external shocks (7,19).

c) Improved food and nutrition health

While it is not clear that eating locally is cheaper, it can improve food access, especially when alternative non-monetary methods of exchange such as bartering are deployed (20). A growing body of literature suggests that some of Africa's

Spotlight on references:

Kasimba S, Covic N, Mostwagole B, Laubscher R, Claasen N. Consumption of traditional and indigenous foods and their contribution to nutrient intake among children and women in Botswana. *Ecology of food and nutrition* 2019;58(3):281-298. Retrieved from: <https://doi.org/10.1080/03670244.2019.1598980>

Indigenous foods, such as edible insects and wild plants, are highly nutritious and hence can enhance the nutritive value of diets (21). A case in point is the morama bean (*tylosema esculentum*, an underutilized wild bean predominantly found in South Africa, Botswana, and Namibia, which is a good source of various nutrients such as calcium, iron and B-vitamins and some phenolic compounds (22). Optimal nutrition is associated with productivity, reduced mortality and health costs and economic growth (23).

d) *Social Justice and Equity*

Several domains of food sovereignty and food security discourses uniquely align and interact in advocacy for social justice and equity. For example, food security supports everyone's equitable access to safe and nutritious foods; this narrative exists in food sovereignty by centering local voices in food systems to enhance self-determination and equal participation (24). Social justice and equity in food systems boost a sense of belonging, nurture good governance and inclusive economies, and equitable access to health and other services (25).

Relevant conceptual theories, methodological tools, frameworks, approaches, gender and equity considerations

Spotlight on references:

Creswell JW, Poth CN. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. (4th ed). CA, USA: SAGE Publications, Inc. 2019

Tobin P, Snyman R. (2008) Once upon a time in Africa: a case study of storytelling for knowledge sharing. *Aslib Proceedings*. Emerald Group Publishing Limited. 2008

This is a qualitative case study that involves:

- Review of existing secondary literature
- Comparative country mapping (Botswana vs South Africa) through in-depth interviews and focus group discussions.

In case study research methodology, a phenomenon is described or explained within its context using various data sources (26,27). Dialogue and storytelling techniques draw upon the African cultural heritage and the oral tradition of sharing knowledge (28).

The idea is anchored in the South African philosophy of Ubuntu (“botho” in Setswana) of 'being self through others', primarily to motivate the culture of collaboration and public engagement in public policy (29).

While this research might not explicitly and conventionally measure the co-benefits due to its qualitative nature; it can enrich the conceptualization process. To date, data on the actual and potential impacts of COVID-19 have been quantified and widely published by several key leading organizations. However, people’s lived experiences have not been fully contextualized and documented. This research, therefore, seeks to fill this gap to complement quantitative analysis by providing insights on food security, food sovereignty, and sustainability within the context of the COVID-19 pandemic.

The specific objectives here are to: 1) describe the history and sequence of events of how COVID-19 affected the local food systems in both countries; 2) examine causal explanations of food shortages and insecurity; 3) investigate the role of emotions, culture, and traditions in facilitating reactions, responses, and interventions in community-based solutions in addressing the COVID-19 crisis; 4) describe the knowledge creation process: to document how existing and new knowledge was utilized and positioned to foster meaning, perceptions, and understanding. This can also be achieved by a robust interrogation, creation, or validation of theories and hypotheses; and 5) evaluate and document the communities' ideas and recommendations in co-creating lasting solutions.

We aim to foster gender equality and equity through the following:

- Adding a gender and stand-alone youth objective: “to assess the specific roles of women and youth in harnessing sustainable and resilient food systems” to spotlight their contributions, amplify their voices, and understand and address existing inequalities.
- Adopting a gendered lens in all research processes from idea conceptualization to data dissemination. For example, during the data collection, we plan for an intentional inclusion of both groups and will ask direct questions relevant to their realities and experiences.
- Where necessary, the focus group discussions will be age or gender-segregated to promote openness and freedom of expression.
- Prioritizing women and youth engagement for any opportunities such as research assistance to share knowledge and to enhance their economic status and skills.
- Disaggregating data to highlight any potential differences of experiences and perspectives.

Measurement of impact

Spotlight on references:

Williams V, Boylan AM, Nunan D. Qualitative research as evidence: expanding the paradigm for evidence-based healthcare. *BMJ evidence-based medicine* 2019; 24(5):168-169. Retrieved from: <http://dx.doi.org/10.1136/bmjebm-2018-111131>

a) Measurement of co-benefits

Qualitative research does not produce statistical measurement-based evidence but provides descriptive and conceptual findings. Qualitative findings largely characterized by people's stories, perceptions, and opinions can help explain quantitative results (30,31).

This research will, therefore, provide unique insights on the interactions between food sovereignty, food security, and how both impact local food system sustainability. For this project it will be imperative to explore some of the following questions:

- How do strong local food systems influence food availability and access?
- Does consumption of locally produced or grown foods and indigenous foods improve climate change and human health?

b) Use of Results

These dialogues will harness and expand conversations on this critical topic. We hope that the findings will influence and guide researchers, development

practitioners (government and non-governmental leaders), communities, policymakers, and different food chain actors (food manufactures, transport, and logistics, retailers, consumers etc.) across the board. These results can also create unique shifts within policies and frameworks because of the emphasis on issues of collaboration, community engagement, and the integration and utilization of Indigenous and traditional knowledge in food systems.

Challenges/barriers and knowledge gaps that impede shifts towards healthier and sustainable food systems

Spotlight on references:

Lane HG, Turner L, Dunn CG, Hager ER, Fleischhacker S. Leveraging Implementation Science in the Public Health Response to COVID-19: Child Food Insecurity and Federal Nutrition Assistance Programs. *Public Health Reports* 2020;135(6):728-736. Retrieved from: <https://doi.org/10.1177/0033354920959285>

McLean R, Gargani J. *Scaling impact: innovation for the public good*. Routledge; 2019.

i) *Methodology*: While there seems to be a paradigm shift in public policy as evidenced by increased calls for holistic approaches through multidisciplinary collaborations, a lot remains to be done with regards to recognizing the value of qualitative research in food systems research. Qualitative inquiry is still questioned and less valued in some sectors.

ii) *Integration of the Holistic/Co-benefits/Intersections lenses*: Despite growing attention to the new concept of systems thinking, there is a lack of resources to guide the implementation process practically. The IDRC training and compendium guidelines enabled me to pragmatically reflect on some challenging implications of intersections in food systems, such as navigating the conflicts between the co-benefits.

iii) *Scaling Science*: The emerging study of implementation science promises to be a gamechanger in public policy by improving the translation of research evidence into concrete actions (32,33). However, more training is required to entrench this crucial principle in research thinking and practice. The IDRC training broadened my understanding of the importance of scaling impact for the public good. This aligns well with the goals of my research idea; during the pandemic, a lot of countries implemented some novel and productive interventions such as increased procurement from local farmers. Some of these actions can be sustained and scaled up post-pandemic.

The choice of the research approach is an intentional effort to normalize qualitative inquiry and nurture the synergistic relationship between qualitative and quantitative methodologies. This research explores the intersections of three central themes in food systems in a way that underscores the importance of joint efforts and interdisciplinary techniques of understanding the co-benefits to enhance public policy.

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GENERATING INCLUSIVE GOVERNANCE FOR LATIN AMERICAN AND CARIBBEAN URBAN FOOD MARKETS: POTENTIAL CO-BENEFITS, DRIVERS, AND BARRIERS

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The majority of urban dwellers in low- and middle-income countries neither grow most of their food at home nor acquire it in supermarkets; they access food in urban markets, such as in municipal covered markets and street markets, and from mobile traders and street food vendors (1-5). The issue remains seldom quantified—particularly in Latin America and the Caribbean—but a study performed in low-income neighbourhoods in three major South African cities shows that 70 per cent of households buy their food from informal outlets (6). Yet, many local and national governments in Latin America and the Caribbean have chosen not to support urban food market actors so that food trade can be maintained and conducted in a safe manner during the COVID-19 pandemic. For instance, many urban food markets have unilaterally been closed based on public health grounds, putting those depending on these informal networks to survive at risk (7-9). The closure of urban food markets belongs to a series of local and national government approaches to informal food trade such as criminalization, formalization, relocation, and supermarketization that exclude food market actors from decision-making and that have documented detrimental impacts on food security and poverty (e.g. 10-11).

Alignment of co-benefits and the intersections of Health and Environments through Food Systems Change

In low-income settlements, food access is a “key development challenge ... and not food supply or availability” (5). Urban governance plays a central role in easing or impeding food access of urban dwellers, and the livelihoods and health and safety of food traders in low- and middle-income countries (5). Governance is understood here as all the modes of governing to guide, steer, control or manage access to food in a specific urban area (12). They include “non-food-related governance actions imposed on food system actors” (5), such as public health regulations during the COVID-19 pandemic and infrastructure provision (or lack thereof).

As argued, existing approaches to governing urban food markets tend to exclude and have negative impacts for food traders and their clients. This proposal argues for better understanding the potential co-benefits of inclusive governance for Latin American and Caribbean urban food markets, as well as the drivers and barriers for its generation and maintenance during the COVID-19 pandemic. The potential co-benefits for low-income urban citizens are intersected and could include, for instance, improvements in food security, livelihoods, health and safety, as well as

in trust and collaboration between traders, residents, and local government representatives.

Inclusive governance is perceived here not only as a means to achieve these co-benefits, but as an end that also needs to be studied. After all, collaborative governance theories suggest that the process of generating collaboration among and between government institutions, civil society and the private sector (including the informal private sector) is as pertinent and significant as its results (13-14).

Relevant conceptual theories, methodological tools, frameworks, approaches, gender and equity considerations

Spotlight on references:

Moragues-Faus A, Battersby J. Urban food policies for a sustainable and just future: Concepts and tools for a renewed agenda. *Food Policy* 2021; 102:124.

Ostrom E. Crossing the great divide: Coproduction, synergy, and development. *World Development* 1996; 24(6):1073-1087.

The theoretical approach draws upon a wide body of literature to theorize existing as well as more inclusive food market governance frameworks in low-income neighbourhoods in Latin America and the Caribbean, including:

- Collaborative and network governance (13-14);
- Co-production (15-16);
- Urban food system governance in low- and middle-income countries (17, 12);
- Governance of built environments, public spaces, and community-based projects in low-income contexts (18-20);
- Governance of disaster risk reduction and urban resilience (21-23); and
- Gender aspects of governance (24-25).

The proposed research idea consists of a multi-case study of existing as well as more inclusive practices of food market governance in a variety of urban governance contexts in Latin America and the Caribbean, for example in Port-au-Prince in Haiti, La Habana in Cuba, and Medellín in Colombia. Of particular interest, in the context of the COVID-19 pandemic, are the existing governance practices of urban food markets and their repercussions on multiple dimensions such as food security, livelihoods and health and safety, and the generation of inclusive governance practices through the implementation of bottom-up initiatives in these markets. Here, their potential co-benefits, and the drivers and barriers related to their implementation are studied.

The potential co-benefits, the drivers, and the barriers would likely vary according to the needs and challenges in different marketplaces and urban governance settings. Hence, the co-benefits are not predefined in the research idea. In the context of the COVID-19 pandemic, they may be well linked to implementing procedures and structures that ensure the health and safety of marketplace users while maintaining trade. However, they may also lead to more pressing initiatives, such as those aiming to build trust and to recognize social and environmental injustices (26). The objectives of that inclusive governance—the creation of co-benefits—will therefore be based on narratives, needs, and desires expressed by urban food market actors while

considering gender and equity dimensions. Therefore, local conceptualizations of co-benefits will likely vary between cases, and will emerge while doing research.

Poverty and food insecurity in Latin America and the Caribbean varies according to gender (27-29). Yet, women often play a vital role in building the social fabric that allows change to occur in low-income neighbourhoods (30, 26). Gender and equity considerations are incorporated into the generation of inclusive governance into the study of their potential co-benefits, drivers, and barriers for its implementation, and into the metrics. As such, the research idea aims to understand and address gender and socio-economic inequities and their drivers present in and around food market governance in Latin America and the Caribbean. Inclusive governance is seen as a way to redefine power relationships among stakeholders and as an alternative to other approaches that tend to marginalize urban dwellers based on their income activity (e.g. street trade), place of residence (e.g. informal settlement), gender, or other dimensions.

Measurement of impact

Spotlight on references:

Juillard H, Mohiddin L, Péchayre M, Smith G, Lewin R. The influence of market support interventions on household food security: An evidence synthesis. Oxford: Oxfam GB. 2017.

Metrics:

- Number of multi-stakeholder partnerships with inclusive governance practices (stakeholders could include market traders, residents, businesses, community-based organizations, and local government representatives);
- Number and frequency of meetings and events related to food market governance;
- Number of women and members of marginalized groups occupying leadership roles in these partnerships and participating in these meetings and events;
- Increase in financial and in-kind contributions from these stakeholders in bottom-up initiatives;
- Improvement in the quality of inter-stakeholder collaboration as well as in the co-benefits for market users (for instance in food security, livelihoods, and health and safety), based on disaggregated data collected in before-and-after surveys;
- Number of references to scientific literature or policy briefs on the drivers and barriers for implementing inclusive food market governance, such as for creating new policy or implementing change in food markets in Latin America and the Caribbean.

Such research would inform policy and have practical implications for urban planners, food security practitioners, policymakers, and community-based organizations in Latin America and the Caribbean on the potential co-benefits of adopting a more inclusive approach to governing urban food markets as well as the possible ways to do so. In fact, the collaborative process advocated in the research is itself a way to influence stakeholders in each marketplace, neighbourhood, and city, on the potential co-benefits of undertaking a different approach to governing urban food markets. For urban planners and local

policymakers, the research would provide tools to engage with local food actors (e.g. women traders, residents, community leaders) and a better understanding of their role in contributing to poverty reduction, food security and health and safety, in ways that build on and not harm the existing functions and attributes of marketplaces. For food security and humanitarian practitioners, it would contribute to the ‘growing consensus on the need to consider and support markets as part of humanitarian responses’ (31) and addresses the need for further ‘research to document the influence of market support interventions’ (31). The research would also provide more evidence for donors to support local and international organizations in improving urban governance of food markets as well as an understanding of the contextual implications linked to various Latin American and Caribbean urban contexts.

Challenges/barriers and knowledge gaps that impede shifts towards healthier and sustainable food systems

Spotlight on references:

Alfers L, Xulu P, Dobson R. Promoting workplace health and safety in urban public space: reflections from Durban, South Africa. *Environment and Urbanization* 2016; 28(2):391-404.

Gupte J, Mitlin D. COVID-19: what is not being addressed. *Environment and Urbanization* 2020; 33(1):1-18.

This research proposal is in line with the perspectives of researchers (32-34; 5) and pro-informal worker and food security organizations (e.g. WIEGO, Health Bridge, and Hivos) arguing that the main problem lies in the lack of recognition and inclusion of actors engaged in informal or alternative ways to provide food in urban governance. Referring to the COVID-19 context, Gupte and Mitlin (35) explain that “there is too little understanding about the importance of building dialogue, exploring collaboration, and co-producing solutions. There is too little understanding as to why social and cultural responses are important, and how the recognition that they are important can be actioned.” Research on cases of collaboration and inclusion of these food actors in urban governance is scarce, limiting the evidence and practical learning needed for scaling up the approach (5). Publications on collaborative governance and co-production related to food access in low-income settlements, while promising, are indeed limited and mostly based on African and Asian contexts (33, 36). Importantly, the “urban” drivers and barriers to improve food access for low-income dwellers are still not well understood in Latin America and the Caribbean.

A better awareness and the improvement of co-benefits are the objective of more inclusive governance for urban food markets. To this date, policymakers have tended to overlook the desired attributes of urban food markets for traders and their clients, such as solidarity, reciprocity, proximity, stability, and security in the case of Haiti (37). This ignorance or misunderstanding, in part caused by the exclusion of informal food actors in urban governance, can result in unilateral policy and interventions that may be well intended—reducing food safety hazards or the spread of COVID-19 disease for instance—but have detrimental impacts on food access and livelihoods for the urban poor. The inclusive governance approach could help uncover the complexity of the intertwined cultural, social, economic, spatial, and physical dimensions embedded in urban marketplaces. A better understanding of that complexity among stakeholders could result in policy and practice that truly result in

generating co-benefits without harming existing functions and attributes of urban food markets.

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SMART TOOLBOX FOR PRACTITIONERS LOOKING TO IMPROVE LOCAL FOOD SYSTEMS: A COLLABORATIVE AND CONVERGENT RESEARCH INITIATIVE

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The sustainable food systems' landscape comprises an extensive repertoire of resources, including approaches, tools, and good practices. Practitioners and policymakers from low- and middle-income countries (LMIC) can find this rich scenario overwhelming and this can sometimes lead to analysis paralysis. Categorizing this overabundance of information in terms of its theoretical background, evaluating its applicability for local contexts, and the most suitable combination of tools and approaches, require technical knowledge, infrastructure, and resources not abundant in LMIC.

This proposal seeks to address the intersection of an overabundance of information supporting the design, implementation and evaluation of interventions within food systems (1-7) and a lack of mechanisms to take advantage of them in places that need it the most. Using a problem-solving lens (8) and proposing a collaborative approach (9) this research aims to develop an evidence-informed "smart-toolbox" aimed at policymakers and practitioners working in LMIC. It will facilitate i) navigating the broad repertoire of available resources promoting healthy, equitable, and sustainable food systems, and ii) making an informed decision on its potential adoption in local contexts.

This research will be developed through an empirical case in Medellin (Colombia, Latin America). Medellin is Colombia's second largest city and is well-known for its industrial development. It is the capital of Antioquia, a state that makes up 13.9% of the country's economy. Despite its advance in infrastructure and market development, Antioquia is the most unequal state in Colombia. During the 90ths and amidst the drug cartels war, Medellin was considered one of the most violent places in the world. The city has developed a long recovery process and now is acknowledged by its transformation and openness to innovation.

Alignment of co-benefits and the intersections of Health and Environments through Food Systems Change

Co-benefits are broadly defined here as the various benefits that can be captured through a single measure (10). It implies tackling multiple issues simultaneously (11). The umbrella of potential benefits can include climate, economic, environment, social and political and institutional aspects (12).

In this research seeking to develop a "smart-toolbox" that is responsive to both the needs of practitioners and policymakers and the realities of LMIC, the notion of co-benefits is included as a lens to analyze the tools that are identified. In the first phase, a systematic mapping process (13) is conducted to identify the scientifically inspired tools and resources that are available. In the second phase, this repertoire is categorized using the co-benefits lens and a special consideration of social aspects involved.

The mapping of potential co-benefits will include the direct and indirect connections that the resources identified present within the multiple components of the food system (14). These co-benefits will be nuanced using a power relations lens, essential in the highly unequal LMIC countries. In particular, this proposal will consider three levels suggested by IPES- Food (15) to analyze power relationships, first, intra-household and community levels; second, relationships between farmers, retailers and traders; and third, general governance of the system. In this sense, a consideration of how power is exerted, reinforced and by whom will be at the center. In a similar vein, to consider inclusion, the four aspects to assess inclusion -ownership, voice, risk and reward- proposed by Vermeulen & Cotula (16) will be considered.

Relevant conceptual theories, methodological tools, frameworks, approaches, gender and equity considerations

Spotlight on references:

NRC (National Research Council). Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond. Washington, DC: The National Academies Press, 2014.

There are two central ideas at the backbone of this research:

- Convergence is an inquiry approach advocating for the integration of tools, knowledges, and ways of thinking across disciplines, creating comprehensive frameworks that are problem-solving-oriented (8);
- Practical and effective collaboration between researchers and policymakers is needed when developing systematic reviews (9).

This research will be developed through an empirical case in Medellin (Colombia, Latin America), a place with openness to innovation processes (17; 18), and with experience identifying potential pathways to face the significant socio-environmental challenges affecting their food systems (19).

This research will contribute to the conceptualization of co-benefits in three ways. First, using a curated list of resources, it will map theoretical co-benefits covering climate, economic, environment, social and political and institutional aspects. It will shed light on the relationships between these co-benefits and how they operate together (for example, if they are context-independent or dependent, or prerequisite/optional) (20).

Second, another two interlinked layers will be added to offer a nuance view on co-benefits: i) power and ii) gender and equity. Gender is defined here as the norms, behaviors and roles associated with being a woman and a man. These social norms guiding behavior by women and men are different and exacerbate inequalities and inequities (21). Equity is based on the idea that people should be treated as equal, in terms of access to life chances, concern on their needs and access to opportunities (22).

Drawing from the groups of inequalities on gender and development proposed by Twyman et al (21), through the research, gender and equity will be operationalized using the following three aspects: i) gender division of labor (and related time use allocation), ii) access to and control over resources (including physical, financial, information, training, and extension, and food as different types of resources), and iii) decision-making (sometimes referred to as women's autonomy or agency but we took a broader approach to look at decision-making more generally).

These lenses will allow an inquiry on how these co-benefits and their interrelationships would operate for specific communities in unequal territories. This will be clearer when developing the empirical case, which will offer a specific context to understand power and gender dynamics linked to co-benefits.

And third, the research will curate a repertoire of resources promoting healthy, equitable, and sustainable food systems with applicability in LMIC contexts. This create a database for researchers wanting to analyze how co-benefits appear when specific tools and approaches are used in other contexts.

Measurement of impact

Spotlight on references:

Lundy M, Amrein A, Hurtado J, Becx G, et al. LINK methodology: a participatory guide to business models that link smallholders to markets. Version 2.0. Cali, Colombia: International Center for Tropical Agriculture, 2014.

The selection of particular metrics on co-benefits will be an outcome of the research itself and are related to the specific type of the resources. Examples of specific types of metrics include targeted aspects within the food system: how to create inclusive market linkages (4), how to measure the professionalization of farmer organizations (5), racial equity (6), or gender equity (23), and how to capture the nutritional quality of food production (7).

For example, some potential metrics that can be used in the case of resources to create inclusive market linkages could be:

- More transparency in the process of public purchases represents an increase in income for farmers due to better market exchanges.
- More transparency in the process of public purchases and a diminution in the barriers that female farmers face owning their productive units increase the participation of production commercialized by female farmers.

This research brings together scholars and practitioners working in sustainable food systems and aims to offer a space to conduct rigorous research that is immediately applicable. Furthermore, when bringing together and facilitating an understanding of several tools pursuing paths for creating sustainable food systems, this research will impact the democratization of knowledge in LMIC. In particular, this research looks to influence professionals making decisions on food system programs, offering a process supporting their selection of scientifically-inspired tools, considering the further ramifications of its implementation in terms of co-benefits, and its implications in terms of power and equity. These professionals (mainly practitioners and eventually policy-makers) work at different fields and areas within municipalities, such as offices of agriculture, public health and environment.

Challenges/barriers and knowledge gaps that impede shifts towards healthier and sustainable food systems

Spotlight on references:

Sharma G, Bansal, P (Tima).
Cocreating
Rigorous and
Relevant
Knowledge. *Academy of Management Journal* 2020;
Available from:
<https://doi.org/10.5465/amj.2016.0487>

The main challenge for this research is the lack of a culture of collaborative research between academics and practitioners. In the city selected for the empirical case, there exists one experience on developing alliances, but this research pushes these boundaries and requires a close collaboration and a minimum shared understanding of how research is conducted. In this sense, advice and good practices on navigating these collaborations (24) will be carefully considered and included in this process.

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4. Commentaries from key experts on cross-cutting themes pertaining to the co-benefits to Health and Environments through food system change

MENTORING EMERGING RESEARCHERS EXAMINING INTER-SECTORAL APPROACHES TO FOOD SYSTEM CHANGE

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As a longstanding researcher in IDRC's Ecohealth tradition (1) and global health research mentor (2), I appreciated being part of the review panel for this research competition. The rationale and opportunities for co-benefits through multi-sectoral food system change are well iterated by Fanzo and colleagues (3), the High Level Panel of Experts on Food Security and Nutrition (4) and Willett and colleagues (5), all cited by different awardees. Similarly, much has been written about potential mechanisms for inter-sectoral approaches to food system change, as in the policy analysis conducted by Parsons & Hawkes (6) for the European Union.

Yet how best to conceptualize and design research of such inter-sectoral approaches which can itself contribute to food system change is a daunting prospect for researchers at whatever career stage. I remember working on a mixed methods proposal to examine urban agriculture contributions to food security and nutrition, while co-teaching population health intervention research. I openly admitted how hard designing such complex research was, so the graduate students and we debated the pros and cons of different research foci, framings, aims, methods and designs for our different research proposals. My thoughts here about ways to nurture researcher journeys which contribute to food system change are rooted in such dialogue. I shall orient my reflections around four key choices emerging researchers and their mentors face: discipline/sector(s), level(s), stance, and expectations.

Which disciplines/sectors to involve?

The panorama of sectors which need to be involved in agri-food systems transformation (7) provides a breath-taking spectrum of research opportunities. For many researchers, their disciplinary backgrounds and institutional locations overly influence both mentors and mentees choices. For example, a suite of proposals which I reviewed for this competition had difficulty moving beyond their agricultural and nutritional science strengths to engage with other sectors, while the accepted proposals in this compendium do involve multiple sectors.

Fortunately, Immersion in transdisciplinary teams can help trainees expand understandings of which sectors and disciplines are important. For example, undergraduates from multiple disciplinary backgrounds doing their honours thesis placements with an agriculture for health and environment project in the Ecuadorian Andes described the expansion of their conceptual frameworks and methodological tools (8). In producing policy recommendations for emphasizing nutritional benefits and decreasing environment and health risks associated with urban agriculture in Kampala, masters (9) and doctoral (10) students contributed

their disciplinary methodological expertise to a multi-sectoral research project. Ways of expanding sectoral horizons, and the associated theoretical and methodological approaches include sets of short intensive courses promoting collaborative learning for both trainees at various career stages (11) and their mentors (12).

What scales or levels to span?

Given the multi-level nature of food systems with numerous links across levels, scoping the levels upon which to focus is a difficult one. Household procurement and consumption practices (Chuma Banji Chinzila, this compendium) is a focus which Ecuadorian former doctoral students now colleagues have found helpful (13). Linkages among food systems, health risks and environments can also be assessed through populations of households using existing data sets (as per Kanchana Wickramasinghe, this compendium) or generating primary data in conjunction with members of producer households. The latter approach was adopted by Peruvian masters trainees and research staff in working with small scale farmers (14) and in Ecuador with members of agroecological associations (15). Agroecology, as promoted by the UN Food and Agriculture Organization (see [Community of Practice \(CoP\) on Family Farming and Agroecology](#)), aims to apply “regenerative ecological principles to agricultural practices...and integrates these practices with environmental, social and economic priorities to contribute to sustainable food systems” (15). Such an approach spanned households and communities, much like Ranaivo Andriarilala Rasolofoson’s proposal (this compendium) to engage with forest communities in community nutritional interventions.

The municipal level, the focus of Jenny Melo Velasco (this compendium) is highly appropriate, given the increasing proportion of populations living in cities. Related is that by David Smith (this compendium) who plans to explore multiple levels of drivers and barriers to inclusive governance of urban food markets. My own engagement with

trainees and researcher-practitioners in East Africa (16) and Toronto (17) highlighted the complexity of such work, so a brave venture for doctoral or post-doctoral studies. Interestingly, provincial-state examinations are missing, but more national examinations of food systems (Bianca Carducci and Tebogo Thandie Leepile this compendium) will be important contributions, depending on the extent to which the data sets that these researchers access adequately include indicators of environments, particularly those relevant to agri-food systems.

What stance to take?

In keeping with decolonizing perspectives (18), global health research must increasingly be collaborative, as emerging researchers engaged in intensive summer institutes articulated well (19). Nevertheless, many researchers regard themselves primarily as observers (Chuma Banji Chinzila in this compendium) or analysts (Kanchana Wickramasinghe in this compendium) whose subsequent knowledge transfer will inform policy makers.

Researchers interested in making change during their research often employ action research approaches, so that changes occur during research implementation, as per Ranaivo Andriarilala Rasolofoson’s proposal (this compendium). Such was the approach adopted by Peruvian masters and early doctoral students in a project evaluating transformations in horticulture (14). A particular form is participatory action research, used by an IDRC Agropolis awardee working with Senegalese peri-urban farmers (20). Melo Velasco (this compendium) proposes such a collaborative approach in developing a toolbox to improve local food systems as a primary goal of her work.

Increasingly emerging researchers are being called upon by oppressed communities to become critical allies for change (21). I have supervised doctoral students who have struggled incorporating such a stance after their field work. More conducive has been earlier adoption by doctoral students who worked with migrant

agricultural workers from Mexico and the Caribbean in critical allyship throughout their doctoral research. They joined coalitions, participated in campaigns, and navigated complex health and migration systems with migrant workers, informing their research on global food system transformation (22).

With what expectations of impact(s)?

Proposal writing seems to require imagining changes in understanding, practice and policy that over-reach the bounds of what any particular research project, program or even field can reasonably influence. As were the majority of applicants in the competition, I was once an emerging researcher rooted in positivist traditions, who expected more rapid uptake of our findings. In fact, it took years from our earliest work modeling of improved health and reduced environmental contamination among farmers (23) through subsequent intervention research with masters and doctoral trainees and post-doctoral fellows (24-25) to eventually inform social movements and persuade policy makers in Ecuador to make changes in agricultural pesticide regulation for health and environment (26).

Adopting constructivist paradigms helps, as do two of the emerging researchers in this compendium (Chuma, Leepile, Rasolofoson). Yet

the embedded political ecology of knowledge, elucidated by a former post-doctoral fellow (27), needs to be more overtly recognized given the global forces of extractivism (28) and financialization (29) affecting our agri-food systems. Together these forces, and the corporate actors behind them, currently make difficult the kinds of food system transformations needed to meet the 2030 SDG global goals (3), particularly since the majority of food is produced by small scale farmers (30). Active monitoring by researchers and others can contribute, as per Bianca Carducci's and Tebogo Thandie Leepile's proposed works in this compendium.

Future directions

Given the challenges which global food systems will offer into the foreseeable future, emerging researchers and their mentors will face ongoing decisions in evolving contexts. Agility will be key to seizing opportunities, and perseverance to seeing the kinds of transformations needed to realize co-benefits for health and environment. At the same time, humility is needed as we collaborate with civil society movements and elected governments to make changes in governance and priorities to take up our research and have the impacts we and our proposals promise.

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4.1 Take a look at some awardees' experiences on engaging with different disciplines relating to the co-benefits of health and environment

Bianca: *"As food systems research crosscuts various sectors such as health, climate, social protection, and education, there are identified benefits and challenges. The current pandemic is particularly emblematic of the need to approach food systems research with an integrative lens and the importance of concerted action. Greater coherence with multilateral bodies and countries' foreign policies could enhance synergies across multiple fragmented agendas, notably related to health, environment, human rights, and security. From my experience, political will, strategic partnership development and mechanisms to ensure sustainability are challenging aspects to measuring, monitoring and improving the food system and co-benefits."*

David: *"While I have had experience in interdisciplinary research, I did not have the chance to work with these disciplines yet. The workshops with IDRC experts and co-awardees, despite time limitations, provided space to initiate discussions on the links between each research idea and the co-benefits. It was particularly exciting to learn how to make research more impactful. It motivated me to pursue and improve my work. I am also looking forward to reading each co-awardee's contribution to the compendium."*

Kanchana: *"Going through this process (IDRC Research Ideas Competition) allowed me to take the lead in conceptualising the research project and in doing so seek collaborators from other disciplines. It has been a tough process navigating the engagements mainly because it is the first time, I am doing it at this level. Previous collaborations were much simpler, but this process stretched me to think of collaborations at a much higher level."*

Ranaivo: *"Working with different disciplines opens the mind to other perspectives. It has greatly improved my proposal. The challenge is in bringing everyone, with different background and training, to be on the same page. It has been quite a time-consuming process for me."*

INTEGRATING GENDER AND EQUITY IN HEALTH AND ENVIRONMENT RESEARCH

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Gender as a cross-cutting issue provides many benefits for researchers in health, food systems and the environment. Applicants of the Ideas Competition were specifically asked to indicate how gender and equity considerations would be included in their innovate research ideas and in the conceptual, theoretical and methodological tools and frameworks that would be used. The strategic inclusion of gender and equity as co-benefits, defined as a win-win strategy to tackle multiple benefits and issues simultaneously that could be achieved by a single policy or measure, provided opportunities for mainstreaming gender in multidisciplinary research that encouraged holistic gender-sensitive policy interventions related to population health and environmental sustainability in LMICs. It encouraged researchers to move beyond their main disciplinary boundaries to explore multidisciplinary solutions to complex nutrition and environmental challenges. This strategy of exploring co-benefits helped to fill knowledge gaps, expanded the range of conceptual, theoretical, and methodological approaches used to not only understand healthy and sustainable food systems, but also offer practical implementation strategies.

Gender concepts, theories and methodologies provide insights into the root causes of power and other inequalities that affect stakeholders in food systems. Gender socialisation explains how people learn ascribed gender roles and responsibilities and behaviour including food choices and eating habits. These behaviours are influenced by demographic and other factors such as age, social class, race and ethnicity, sexuality, ability/disability, religion, rural/urban, citizenship status and explain how groups interact with economic, political, and environmental systems. They also demonstrate how women's disproportionately higher levels of caregiving affects their labour force participation rates, access to jobs, occupational choices, gender-wage gaps, and gender differentials in access to resources, power, leadership and decision-making. All directly and indirectly impact food systems but may be ignored if gender is not integrated in research.

GENDER MAINSTREAMING AND GENDER ANALYSIS

Gender analysis, gender mainstreaming (1-4) and intersectionality (5), are valuable conceptual and analytical tools to promote equality, equity and sustainable development. Using these tools can contribute to building knowledge and capacity to fulfil commitments to rights-based, evidence-based policy-making.

The quality of sex disaggregated data in food systems research, can provide evidence to understand the root causes of inequality that can affect desired outcomes. This data will also be more culturally relevant and useful to develop policies and interventions that are gender-sensitive and inclusive or gender-transformative.

Gender-sensitive means that they take account of gender-related differences and address differential needs of boys and girls, vs adult men and women for example. Gender transformative means that the policies and interventions seek to radically change unequal gender relations among women and men farmers for example. Adopting these strategies in food systems research can help to ensure that projects do not reinforce existing gender stereotypes and inequalities; and can measure progress towards gender equality.

Valero (6) notes that gender statistics measure the impact of policies and programmes. UN Women (7) agrees, but their concern is that only 13% of countries allocate budgets to collect gender statistics. This is likely to be a problem for many of the study countries.

Gender mainstreaming also facilitates stakeholder participation in ensuring that food is produced, distributed and consumed equitably to protect the right to food for all. UN's Food and Agriculture Organization's Policy on Gender Equality (8) promotes gender mainstreaming, along with other valuable on-line resources to support gender in food systems such as its Guides for Gender Mainstreaming and for using ICTs for Agriculture and Rural Development (2). Danielsen (9) also notes the importance of integrating gender in agriculture and food security research.

Quantitative and qualitative gender indicators can be used to monitor and measure impact and change over time. Quantitative indicators measure change using numbers (e.g., to compare food security for adult males and females) before and after a programme intervention. Qualitative gender indicators measure changes in behaviour and attitudes. Triangulating data can guide cost/benefit analyses of short-medium-long term impacts and outcomes with/without gender considerations. Furthermore, researchers

should also consider governance frameworks that support gender mainstreaming as a strategy to achieve gender equality and sustainable development.

Including gender considerations in the Call helped to mainstream gender and equity in several disciplines that may not otherwise have considered this relevant. Research that integrates these considerations is more likely to achieve the UN 17 Sustainable Development Goals 2015-2030 (10), especially those related to poverty reduction (SDG1), reducing hunger (SDG2), promoting gender equality (SDG5) and reducing inequality (SDG10). Furthermore, several goals, indicators, and certain targets related to the environment and climate action (SDG13.1) are all relevant to the proposals submitted for the Call. It however challenged researchers to explore multiple inequalities that impact people's everyday lives and livelihoods. Initial proposals reviewed showed varying levels of capacity to integrate gender perspectives. Questions at the Ideas workshop with awardees indicated that some applicants had not fully understood the strategic importance of gender in their research. Mentors worked with awardees and the revised proposals presented in this Compendium reflect much stronger multidisciplinary gender-sensitive and gender transformative proposals, with the potential to have multidimensional policy impacts. The section below provides some insights into how gender considerations enhanced the innovative project ideas submitted:

- By incorporating links between power gender dynamics and equity to reduce barriers for female farmers to become more productive and commercially viable (Jenny Melo-Velasco in this compendium);
- By using gender as a cross-cutting issue and an analytical tool in mixed methods research on the food environment, with its integration into the sampling method for the qualitative components, to assess

gender differences among the poorest and most nutritionally vulnerable groups (Bianca Carducci in this compendium);

- By leveraging machine learning for the interlinkages between food systems, health risks and the environment of Sri Lanka to measure gender-based differences regarding health outcomes and impact on disease prevalence (Kanchana Wickramasinghe in this compendium);
- By illustrating the intersection of gender, race and class inequalities through a gender analysis to show differential access to sustainable healthy food and women's participation in the food system exacerbated by the COVID-19 pandemic (Chuma Banji Chinzila in this compendium);
- By building on women's reproductive role as family caregivers and their knowledge to design nutrition interventions aimed at empowering groups of women in forest communities (Ranaivo Andriarilala Rasolofoson in this compendium);
- By integrating a participatory approach using gender, class and power analysis to explore more equitable, inclusive and gender-sensitive governance in urban food markets (David Smith in this compendium);
- By adopting gender and age perspectives in research to understand the intersections between food sovereignty, food security, and the sustainability of Africa's food systems during and beyond COVID-19, and engaging women and youth to share their knowledge and enhance their skills and economic status (Tebogo Thandie Leepile in this compendium).

These research proposals show expanding literature and knowledge in specific disciplines; improving the targeting of benefits to vulnerable groups of diverse backgrounds; increasing returns on financial investments; building human capital; and promoting economic growth and equitable, sustainable development.

Indeed, the awardees' contributions indicate that there are many advantages to using interdisciplinary, multidisciplinary, and multisectoral strategies to address health and environmental problems. This is because of the dynamic relationship between social, economic, political and environmental systems. Pre-existing gender and other inequalities have been highlighted by the COVID-19 pandemic as noted by several organisations including the World Bank (11).

KEY CHALLENGES DRAWN FROM PERSONAL EXPERIENCES

Managing change and understanding how the complexities of gender roles, responsibilities and unequal power relations influence behaviour in food systems can be challenging.

Serving as Gender Advisor for the IDRC-funded Project: *Improving Household Nutrition Security and Public Health in the CARICOM region* (FAN Project/Food for Change Caribbean Project) (12) provided opportunities to integrate gender in the multidisciplinary food and nutrition research studies and interventions as well as review food and nutrition policies in CARICOM, and the three project countries: Jamaica, St Kitts and Nevis and St Vincent and the Grenadines. The aim was to find gender-sensitive solutions to the chronic problem of NCDs. The University of the West Indies was the main coordinating agency with partnerships from the University of Technology, and several other academic institutions and development stakeholders within and outside the Caribbean.

Limited awareness of gender was addressed by organising gender sensitisation sessions, integrating gender perspectives in the design and implementation of research studies, interventions, reports, and use of gender indicators to measure progress. Lessons in 'scaling up' findings (13) from the FAN Project to policy levels, included organizing validation

workshops, policy dialogues with governments, private sector, civil society, and international partners, and conducting gender analyses of national food security policies to assess coherence between policy commitments to gender equality and national policies. Using participatory methodologies such as Group Model Building and Causal loop diagrams in stakeholder workshops, helped to identify inhibiting and enabling factors for health promotion and food security; and interlinkages between food production, distribution, and consumption of healthy and unhealthy foods (14). The FAN Project's gender-sensitive information dissemination strategies facilitated 'scaling up' (13), using on-line platforms in response to the COVID-19 pandemic such as: a

Food for Change Website (12), an e-newsletter, webinars, presentations to policy makers as well as scholarly publications.

In conclusion, integrating gender into research on food systems and the environment, support gender-sensitive data collection and analysis, evidence-based policy making, and targeted programmes that support sustainable development. The Ideas Competition has made a significant contribution to sharing this knowledge across disciplines. Separately and together the awardees innovative research projects can help to promote the value and benefits of interdisciplinary research on food systems linking health and the environment.

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4.2 Check out these useful resources on gender and equity for your research

- UN *Convention on the Elimination of all forms of Discrimination Against Women* (CEDAW) on women's rights, gender equality and gender mainstreaming used in several research proposals;
- UN *Convention on the Rights of the Child* (CRC) for the protection, survival, and development of children who are among the most vulnerable, at risk of poverty and malnutrition;
- UN *Convention on the Rights of Persons with Disabilities* (CRPD) on the rights of this vulnerable group to access, inclusion equality in development. Stigma and discrimination often contribute to higher levels of poverty unemployment, poor health and food insecurity among women men and children with different types of disabilities;
- Canada's *Feminist International Assistance Policy* (2017) has six policy actions and indicators to advance gender equality and the empowerment of women and girls.

Equality in access to public health for all is reflected in World Health Organisation (WHO) *Alma Ata Declaration* (1978) and *Asana Declaration* (2018) promotes the integration of health in all policies. These commitments provide a framework for a rights-based approach to development that requires government policy makers as duty-bearers to create an enabling environment for citizens as rights-holders to access their basic rights which were originally outlined in the *Universal Declaration of Human Rights* in 1948. Policy makers within and outside the countries that these research project will impact should be mindful of international commitments that their governments have signed and ratified.

5. Conclusion

Global food systems and human dietary patterns have detrimentally impacted the health of populations and the environments, and contributed to social, health, and economic inequities. In response to these global food systems challenges, the Research Ideas Competition sought to catalyze the development of novel ideas by early career researchers. It provided an opportunity for these researchers to explore conceptual and methodological innovations to support the study of co-benefits for health and environments, while highlighting lessons for future initiatives and research in this area. The integration of gender into food systems research is critical to support gender-sensitive data collection and analysis, evidence-based policy making, and targeted programmes towards sustainable development. This Competition has underscored the importance of deliberately exposing early career researchers to perspectives, skill-building and mentorship opportunities outside their primary discipline. Given the complex challenges facing global food systems into the foreseeable future, which have been further exacerbated by COVID-19, more research on emerging opportunities is needed to realize co-benefits for health and environments through food systems change.

We hope that researchers and practitioners find this compendium useful and that it helps inspire new ideas to help tackle global food systems challenges.

6. Appendices

APPENDIX 1: ENGLISH CALL FOR RESEARCH IDEAS

Research Ideas Competition (*updated*)

Pursuing the co-benefits for Health and Environments through food system change

Overview

Canada's International Development Research Centre (IDRC) is pleased to announce a new Research Ideas Competition to promote health, sustainability and equity in Low- and Middle-Income Countries (LMICs). The IDRC, a Canadian Crown corporation, funds research in developing countries to create lasting change on a large scale and supports local organisations in the Global South to generate the evidence that is relevant in their context. The IDRC is working with the University of Toronto's Dalla Lana School of Public Health and Faculty of Arts and Sciences to manage this competition and ensure scientific integrity, ethical oversight and inclusivity.

The goal of this competition is to inspire **novel research ideas** that aim to strengthen policy interventions, population health, environmental sustainability and/or health, gender and social equity in LMICs. These novel ideas are expected to deliver health and environmental co-benefits by addressing the interlinked nutrition and environmental challenges and knowledge gaps that impede shifts towards healthier and sustainable food systems. These ideas will promote a conceptual understanding of healthy and sustainable food systems and account for the practical realities of their implementation.

This competition aims to:

- 1) Identify novel, solutions-oriented research ideas that promote healthy and sustainable food systems in LMICs;
- 2) Support interdisciplinary exchange of ideas that draw upon different theories, methodological tools, frameworks, and approaches;
- 3) Harness lessons from research, civil society and policy spheres which bridge the fields of global health, food systems and environmental sustainability research.

Geopolitical focus: Proposed research ideas must be relevant and applicable to LMIC settings, with a particular focus on low-income communities. This includes, but is not limited to, a theoretical or practical grounding in specific local LMIC context(s), the relevance of an idea to local research, policy or community actors, and how an idea builds on previous engagement with local actors.

Award Details: 10 winning applications will receive \$10,000 CAD *each administered directly to the primary applicant*. The award will be provided upon the submission of the final idea write up and a formal presentation at the Ideas Symposium (virtual or in-person²). Award-winners will have access to mentorship from a broad interdisciplinary network of mentors including scientific and technical support. Award-winners will also have the opportunity to further strengthen their idea, contribute to a global compendium of research ideas, and attract the attention of a wider audience of researchers, trainees, policy-makers, funders and practitioners.

² Subject to COVID-19 related mobility restrictions. A modest travel supplement may be provided to facilitate the participation of the lead researcher if it will be in-person.

Eligibility Criteria: *The primary applicant for this call* must be a Doctoral Student or Post-doctoral Fellow that is Canadian, permanent resident of Canada, or citizen of LMICs³ enrolled in a doctoral degree or post-doctoral fellowship program at a recognized university.

Application Procedure: To submit applications (in either English or en français) and supporting documents to idrc.researchideas@utoronto.ca

Deadline for Submission: Friday December 11th 2020 (17:00 Eastern Daylight Time).

Background and Rationale of the Call

Over the past five decades, global food systems and human dietary patterns have changed substantially. Transitions to unhealthy and unsustainable diets are not only increasing the burden of obesity and diet-related non-communicable diseases such as diabetes and certain cancers but are also contributing to environmental degradation and climate change. LMICs are disproportionately affected with more rapidly rising rates of non-communicable diseases in younger populations that further deteriorate health and strain economic resources for all.

Unhealthy diets are the largest contributor to the global burden of disease. Globally, more than 2 billion people are overweight or obese –of which 41 million are children under the age of five years. Obesity alone accounts for 4 million deaths annually and costs the world about 2.8% of Gross Domestic Product. At the same time, about 820 million people remain undernourished, 150 million children are stunted, and more than 2 billion people are micronutrient deficient.

Not only are global diets unhealthy they are also unsustainable. The food systems that produce much of what the world consumes are the single largest cause of global environmental change. For example, agriculture occupies about 40% of global land, and food production is responsible for up to 30% of global greenhouse-gas emissions. The unsustainable nature of global food systems and their impact on climate change creates a vicious cycle. Unsustainable food systems contribute to climate change which over time will affect food production and ultimately human health. The effects of this vicious cycle will be felt most severely across LMICs and specifically in fragile states and climate change hotspots within these countries.

There is an important need to support LMIC researchers, policy-makers and civil society actors to understand how to promote environmentally sustainable and healthy food systems in LMICs. This recognizes that over the past five decades, global food systems and human dietary patterns have changed substantially and have resulted in detrimental impacts to the health of populations and the environments which sustain them. Furthermore, these global dietary patterns are promoting or further exacerbating social and economic inequities, with already vulnerable populations disproportionately facing health and environmental burdens which result from inadequate food systems.

Novel ideas are needed to address the interlinked challenges of nutrition and climate change by promoting shifts towards healthier and sustainable food systems. To date, global actions to this challenge have been slow, uninspiring and insufficient to promote population health and equity, and the environments which sustain them. At the same time, promising transformative interventions and opportunities can be found within low- and middle-income countries where the impacts of climate change are most apparent. The scale and ambition of the challenge requires LMICs to fully participate in and shape this discourse. Ultimately, a global transition to a healthy,

³ <http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-of-ODA-Recipients-for-reporting-2020-flows.pdf>

equitable and sustainable food system must involve local representation, Southern leadership and research-driven solutions, which are meaningful, feasible and sustainable in LMIC contexts.

Scope and thematic directions of the call

This Research Ideas competition aims to identify novel, solution-oriented ideas in research to promote healthy, climate-resilient and sustainable food systems in the Global South through interdisciplinary exchange of ideas that draw upon different theories, methodological tools, frameworks, and approaches. Lessons from research, civil society and policy spheres will be harnessed to bridge the fields of global health, food systems and environmental sustainability research.

Applications are encouraged to propose ideas relevant to the following thematic directions:

1) Developing a practical understanding of food systems models and frameworks

The relationship between health, environmental sustainability and food is highly complex and influenced by multiple, non-linear, adaptive drivers and dynamics. Several different conceptual frameworks and models have been proposed to capture and model these relationships and interactions that shape food systems. These models include, for example, the 2017 report by the High Level Panel of Experts on Food Security and Nutrition, the Global Syndemic Model (Swinburn et al 2019), and the Sustainable Food Systems Model (Downs et al. 2020). Common to all of these models and other frameworks is a recognition that sustainable food systems include not only food production value chains (which include production, storage, processing, distribution and retail systems), but also consumer-side factors, political and socio-cultural determinants of health and equity, environmental factors and many other critical drivers. There are also growing efforts to integrate these food systems models and frameworks with understandings of global environmental dynamics and change processes. While these models advance a more comprehensive and intersectoral understanding of food systems, there is an important need to develop their practical utility.

Possible gaps or challenges to address may include, but are not limited to research to:

- Guide practical decision-making or advise local policy-making to promote healthy and sustainable diets;
- Identify levers and priorities within these food systems for research, policy interventions and community action and how key actors in transformative change may leverage parts of these systems to effectively improve health and equity, and environmental sustainability;
- Understand how economic, legal and political spheres may act as facilitators, barriers or constraints to positive transformations to food systems;
- Promote healthy and sustainable food systems through systems-level actions, policies, and structural changes that can spur sustainable and large-scale behaviour change.

2) Strengthening the coherence of food systems interventions

Research is needed on what the integration of environmental sustainability and intersectoral co-benefits might mean in the context of healthy and sustainable diets. Much of the environmental sustainability discourse has revolved around the impacts of climate change and adaptation options to mitigate against these impacts. In addition, greater emphasis on the environmental goals in food systems research and policy-making is required.

Possible gaps or challenges to address may include, but are not limited to research to:

- Prioritize the integration of sustainable solutions (e.g. low/zero carbon emissions, less water intensive food production, reduction in agrochemical usage, healthy soils, biological diversity, air quality, etc.) within food systems interventions and their metrics (i.e. key indicators or indices) that can and should be measured towards these goals;
- Strengthen food systems and related policies aimed at making them more prepared, equitable and resilient for future threats to global health and environmental sustainability;
- Identify novel ideas and policies that not only focus on the health and sustainability of food systems, but also downstream benefits and returns towards economic growth and prosperity (or vice versa);
- Identify measurement and assessment tools that can help policy-makers better understand the multi-sectoral impacts and trade-offs of different policy pathways towards improving food systems.

3) Enhancing vulnerability and equity dimensions of food systems

There is a growing scholarship on the gendered and other intersectional dimensions of food systems, including its differential impacts on various population groups. Building and promoting healthy and sustainable food systems requires designing and implementing intersectoral actions, structure and policies that go beyond the health and environment domains, to also encompass social, economic, and equity dimensions. The anticipated and unanticipated consequences of food systems interventions require further study.

Possible gaps or challenges to address may include, but are not limited to research to:

- Understand how pro-equity economic and social policy interventions can deliver positive knock-on effects towards food systems to improve health and environmental sustainability;
- Understand who bears the health and environmental burden of food systems in LMICs;
- Identify whose rights are upheld and whose priorities are represented in food systems, both in their current structures and in the future trajectories of shifting food systems;
- Ensure food is produced, distributed and consumed in a sustainable and equitable manner that protects the right to food for all;
- Understand how different structures, policies, and models of food systems might reduce, or contribute to, gender inequality.

Key considerations: Building back better from COVID-19

As one of the most serious pandemics of the century, the current COVID-19 pandemic is creating new and dramatic challenges for food and nutrition security and is expected to incur long-lasting and significant impacts on the health of populations worldwide. The pandemic is also exposing deep and entrenched fractures in social, economic, health and food systems worldwide, putting into sharp focus, untenable structures, policies, and practices which drive poor global health and environmental degradation, and which exacerbate long-standing and historical inequities amongst marginalized populations. Building on growing support for major changes to these systems, global health and environmental advocates have advanced the concept of ‘building better’ – envisioning and promoting the deep structural changes which are needed to advance a vision of a healthier and more equitable world.

While not a specific thematic direction under this Call, research ideas should be **grounded in the current global realities resulting from the COVID-19 pandemic** and should use the global discourse on ‘building better’ as a starting point for looking ahead and promoting innovative and impactful change.

Application Requirements

Eligible applicants to this competition are required to submit a **proposal (maximum 5 pages)** of a research idea which directly addresses at least one of the three aforementioned thematic directions, and is informed by the key consideration of ‘building better from COVID-19’. In addition, *the applicant can provide the details of up to two co-collaborators (optional) and their affiliations* when completing an [application form](#) (a copy can be downloaded). Please note that all applicants will retain **all intellectual ownership of their idea** and will be able to further develop it as they would like. Applicants are not obligated to publish their proposal in the compendium of ideas.

The proposed research idea should be a research topic which explains:

- a brief overview of the state of knowledge on this research topic;
- a rationale which explains why and how research on this topic responds to the needs and priorities of the Global South, and how further research could help priority setting with donors;
- a description of the theory, framework and/or methodological approach which could be used to describe and investigate this priority;
- clarity and appropriateness in addressing the ethical considerations of the proposed research;
- the expected impact of research into this area as well as metrics or approaches that could be used to measure this impact.

In addition to this proposal, *the CV of the primary applicant and one letter of support from a supervisor or a mentor that can speak to the potential for the idea and the research environment where the doctoral or post-doctoral fellow is based, should be included. Additional figures, frameworks, or scientific references can also be added in the supporting annexes (up to a maximum of three appendices and not included in the proposal page limit).*

Selection Process

Applications received in this competition will undergo a two-stage review process:

Eligibility and Relevance Screening

-Does the application meet all eligibility and relevance screening criteria?

-Is the idea aligned with the scope, and one or more thematic directions and key consideration of this competition?

-Is the idea appropriate and relevant to the local LMIC context?

-Is there a clear explanation as to the unique and novel value that this idea will bring to the field of food systems and sustainability research?

-Who are the primary beneficiaries of the proposed idea?

-Does the research idea take into account relevant ethical considerations?

-Does it aim to improve equity and reduce vulnerabilities?

-Does the applicant have the support from their supervisor or mentor for their idea?

Advanced Technical Review

A panel of peer reviewers with relevant expertise in line with the themes of this call will assess applications based on the following criteria:

Theoretical and practical grounding: Is the idea grounded and well-supported in a theoretical and practical understanding of the research? Does the application sufficiently describe the current state of knowledge on this topic (from the scientific and grey literatures, documented policy experiences, or community perspectives)? Has the idea considered the roles of sex, gender and other diverse identities and experiences in the design, analysis, and implementation of this research idea? Does the research idea take into account relevant ethical considerations? Does the idea consider how vulnerable or marginalized groups will be impacted by this research idea?

Feasibility: Does the idea hold practical value? How easily might this idea be taken up by other researchers and policy-makers in LMICs, or by funding organizations or development agencies who implement actions? Does the idea explain which actors must be involved in the implementation of this idea and how their buy-in will be incentivized and coordinated? If not immediately applicable, does the application reflect upon key barriers and facilitators for potential implementation including positioning for impact, processes for incentivizing uptake, needed policy supports?

Scalability: How potentially scalable or applicable is this idea to different geographic regions, different socio-political contexts, or different jurisdictions (local, national, regional)? What is the potential scale of impact? How will the idea be socialised – is it just a technical solution or is the policy context favourable? How might change coalitions be created, supported and expanded upon?

Impact and Positioning for Transformation: What impact will this idea have in promoting healthy, equitable, and sustainable food systems? What is the theory of change and where does this idea fit on this pathway(s)? How will progress and change be measured?

Key Dates

Deadline for submission of research idea:

December 11th 2020

Successful applicants will be invited to further their ideas through mentorship: February 2021

Ideas Symposium (virtual or in-person):

Spring 2021

Contact for Further Information

Any inquiries related to the Call and application process should be sent by e-mail to idrc.researchideas@utoronto.ca

APPENDIX 2: FRENCH CALL FOR RESEARCH IDEAS

Concours d'idées de recherche (*mis à jour*) sur le thème :

Obtenir des avantages pour la santé et l'environnement en modifiant le système alimentaire

Aperçu

Le Centre de recherches pour le développement international (CRDI) du Canada est heureux d'annoncer un nouveau concours d'idées de recherche visant à promouvoir la santé, la durabilité et l'équité dans les pays à faible revenu et à revenu intermédiaire (PFR-PRI). Le CRDI, qui est une société d'État canadienne, finance la recherche dans les pays en développement afin d'opérer des changements durables à grande échelle et aide des organisations locales de l'hémisphère sud à produire des données probantes utiles à leur contexte. Le CRDI collabore avec l'École de Santé Publique Dalla Lana et la Faculté d'Arts et Sciences de l'Université de Toronto pour gérer ce concours et en garantir l'intégrité scientifique, la surveillance éthique et le caractère inclusif.

L'objectif du concours consiste à inspirer de **nouvelles idées de recherche** pour renforcer les interventions stratégiques, la santé des populations, la durabilité et la santé environnementale, l'égalité des genres et l'équité sociale dans les PFR-PRI. Les idées novatrices proposées dans le cadre du concours devraient apporter des avantages en matière de santé et d'environnement en s'attaquant aux problèmes interdépendants d'alimentation et d'environnement, et aux lacunes dans les connaissances qui entravent le passage à des systèmes alimentaires sains et durables. Ces idées permettront également d'améliorer la compréhension conceptuelle des systèmes alimentaires sains et durables, et de prendre en compte les aspects pratiques de leur mise en œuvre. Le concours vise à :

- 1) trouver de nouvelles idées de recherche axées sur des solutions en appui à des systèmes alimentaires sains et durables dans les PFR-PRI;
- 2) appuyer la mise en commun entre différentes disciplines d'idées fondées sur une variété de théories, d'outils méthodologiques, de cadres et d'approches;
- 3) tirer parti des leçons apprises d'autres recherches, de la société civile et des sphères politiques en établissant des liens entre les recherches sur la santé mondiale, les systèmes alimentaires et la durabilité environnementale.

Orientation géopolitique : Les idées de recherche proposées doivent être pertinentes et adaptées au contexte des PFR-PRI, avec un accent particulier sur les communautés à faible revenu. Cela comprend notamment des fondements théoriques ou pratiques en fonction des contextes locaux propres aux PFR-PRI, la pertinence d'une idée du point de vue de la recherche, des politiques et acteurs communautaires locaux, et la manière dont l'idée s'inscrit dans le prolongement d'un engagement antérieur auprès des acteurs locaux.

Propositions gagnantes : Les 10 propositions gagnantes recevront 10 000 CAD chacune, *versés directement sur le compte du (de la) postulant(e) principal(e)*. Les prix seront remis après la présentation de la version définitive des propositions et une présentation officielle à l'occasion du colloque des idées (virtuel ou en personne⁴). Les lauréats auront accès à un vaste réseau interdisciplinaire de mentors capables d'offrir du soutien scientifique et technique. Les lauréats auront également la possibilité de peaufiner leurs idées, de participer à la création d'un recueil global d'idées de recherche et d'attirer l'attention de nombreux chercheurs, stagiaires, décideurs politiques, bailleurs de fonds et praticiens.

⁴ Sous réserve des restrictions de déplacement liées à la COVID-19. De modestes frais de déplacement pourraient être remboursés pour faciliter la participation en personne du chercheur principal, le cas échéant.

Critères d'admissibilité : *Le(a) postulant(e) principal(e) doit être un(e) étudiant(e) en doctorat ou boursier(ère) de recherches postdoctorales qui est soit Canadien, résident permanent du Canada, ou citoyen d'un pays à faible revenu et à revenu intermédiaires PFR-PRI⁵ inscrits pour un diplôme de doctorat ou une bourse de recherche postdoctorale d'une université reconnue.*

Marche à suivre pour présenter une proposition : Pour présenter une proposition (en anglais **ou** en français) et les documents à l'appui à idrc.researchideas@utoronto.ca

Date limite de présentation d'une proposition : Le vendredi 11 décembre 2020 (17 h, heure de l'Est).

Contexte et but de la demande de propositions

Au cours des cinquante dernières années, les systèmes alimentaires mondiaux et les habitudes alimentaires des humains ont considérablement changé. Le passage à des régimes alimentaires malsains et non durables ne fait pas qu'augmenter l'obésité et les maladies non transmissibles liées à l'alimentation, comme le diabète et certains cancers, mais il contribue aussi à la dégradation de l'environnement et aux changements climatiques. Les PFR-PRI sont touchés d'une façon disproportionnée par l'augmentation marquée de maladies non transmissibles chez les jeunes, ce qui est préjudiciable à la santé et aux ressources économiques de tous.

Les régimes alimentaires malsains jouent un rôle prépondérant dans la charge de morbidité mondiale. Dans le monde, plus de 2 milliards de personnes ont de l'embonpoint ou sont obèses, ce qui comprend 41 millions d'enfants de moins de cinq ans. À elle seule, l'obésité est responsable de 4 millions de décès par année et coûte environ 2,8 % du produit intérieur brut mondial. Paradoxalement, environ 820 millions de personnes sont sous-alimentées, 150 millions d'enfants souffrent d'un retard de croissance et plus de 2 milliards de personnes souffrent de carences en oligo-éléments.

Non seulement les régimes alimentaires mondiaux sont malsains, mais ils sont également non durables. Les systèmes alimentaires qui produisent une grande partie de ce que le monde consomme sont la principale cause des changements environnementaux à l'échelle planétaire. Par exemple, environ 40 % des terres de la planète sont réservées à l'agriculture, et la production d'aliments est à l'origine de près de 30 % des émissions mondiales de gaz à effet de serre. Le caractère non durable des systèmes alimentaires mondiaux et leur impact sur le climat créent un cercle vicieux. Les systèmes alimentaires non durables contribuent aux changements climatiques, lesquels nuiront tôt ou tard à la production alimentaire et, en fin de compte, à la santé humaine. Les effets de ce cercle vicieux se feront sentir le plus fortement dans les PFR-PRI, et plus particulièrement dans les États fragiles et les points névralgiques des changements climatiques dans ces pays.

Il est important de soutenir les chercheurs, les décideurs politiques et les acteurs de la société civile des PFR-PRI afin de déterminer comment promouvoir des systèmes alimentaires sains et durables sur le plan environnemental dans ces pays. On sait qu'au cours des cinquante dernières années, les systèmes alimentaires mondiaux et les habitudes alimentaires des humains ont considérablement changé, ce qui a entraîné des effets néfastes sur la santé des populations et les environnements qui assurent leur bien-être. Qui plus est, ces habitudes alimentaires mondiales favorisent ou exacerbent les inégalités sociales et économiques, les populations déjà vulnérables étant confrontées de manière disproportionnée aux conséquences sanitaires et environnementales de systèmes alimentaires inadéquats.

On a besoin de nouvelles idées pour résoudre les problèmes interdépendants de l'alimentation humaine et des changements climatiques en amorçant une bifurcation vers des systèmes

⁵ <http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-of-ODA-Recipients-for-reporting-2020-flows.pdf>

alimentaires sains et durables. Jusqu'à présent, les mesures prises à l'échelle mondiale pour résoudre ces problèmes sont lentes, insuffisantes et peu inspirantes pour promouvoir la santé et l'équité au sein des populations, ainsi que pour protéger les écosystèmes dont elles dépendent. Parallèlement, on trouve des interventions et des possibilités de transformation prometteuses dans des PFR-PRI où les effets des changements climatiques sont les plus évidents. En raison de l'ampleur du défi, les PFR-PRI doivent participer activement au dialogue et faire partie intégrante de la solution. En fin de compte, la transition mondiale vers un système alimentaire sain, équitable et durable implique une représentation locale, un leadership par l'hémisphère sud et des solutions axées sur la recherche qui soient significatives, réalisables et durables dans le contexte des PFR-PRI.

Portée et orientation thématique de la demande de propositions

Le but de ce concours d'idées de recherche consiste à rassembler des idées de recherche novatrices et axées sur des solutions afin de promouvoir des systèmes alimentaires sains, résistants au climat et durables dans l'hémisphère sud grâce à la mise en commun, entre différentes disciplines, d'idées fondées sur une variété de théories, d'outils méthodologiques, de cadres et d'approches conceptuels. On tirera parti des leçons apprises grâce à d'autres recherches, de la société civile et des sphères politiques en établissant des liens entre les recherches sur la santé mondiale, les systèmes alimentaires et la durabilité environnementale.

On encourage la présentation de propositions de recherche sur les thèmes suivants :

1) Acquérir une connaissance pratique des modèles et des cadres des systèmes alimentaires

Les liens entre la santé, la durabilité environnementale et l'alimentation sont très complexes et dépendent de multiples facteurs et de forces dynamiques qui sont adaptatifs et non linéaires. On a proposé différents cadres et modèles conceptuels pour saisir et modéliser les liens et les interactions qui façonnent les systèmes alimentaires. Ces modèles comprennent notamment le rapport de 2017 du Groupe d'experts de haut niveau sur la sécurité alimentaire et la nutrition, le modèle syndémique mondial (Swinburn et coll., 2019) et le modèle de systèmes alimentaires durables (Downs et coll., 2020). Dans tous ces modèles et dans d'autres cadres, l'on reconnaît que les systèmes alimentaires durables comprennent non seulement les chaînes de valeur de la production alimentaire (y compris les systèmes de production, de stockage, de transformation, de distribution et de vente au détail), mais aussi les facteurs liés aux consommateurs, les déterminants politiques et socioculturels de la santé et de l'équité, les facteurs environnementaux et de nombreux autres facteurs essentiels. En outre, on doit de plus en plus intégrer ces modèles et cadres de systèmes alimentaires aux réflexions sur les forces dynamiques environnementales et les processus de changements à l'échelle mondiale. Ces modèles nous aident à comprendre les systèmes alimentaires d'une manière globale et intersectorielle, mais il est important d'améliorer leur utilité pratique.

Les lacunes à combler et les problèmes à résoudre comprennent notamment des travaux de recherche visant à :

- éclairer la prise de décisions pratiques et à encourager les décideurs politiques locaux à promouvoir des régimes alimentaires sains et durables;
- déterminer les leviers et à établir les priorités dans ces systèmes alimentaires pour la recherche, les interventions stratégiques et l'action communautaire, et la manière dont les principaux agents de changement peuvent tirer parti de certains éléments de ces

systèmes pour améliorer efficacement la santé, l'équité et la durabilité environnementale;

- déterminer comment les sphères économiques, juridiques et politiques peuvent faciliter, limiter ou empêcher une transformation positive des systèmes alimentaires;
- promouvoir des systèmes alimentaires sains et durables grâce à des mesures, à des politiques et à des changements structurels à l'échelle des systèmes qui peuvent induire un changement de comportement durable et à grande échelle.

2) **Accroître la cohérence des interventions visant les systèmes alimentaires**

Il faut se pencher sur l'intégration de la durabilité environnementale et des avantages intersectoriels connexes en relation avec une alimentation saine et durable. Le discours sur la durabilité environnementale tourne en bonne partie autour des conséquences des changements climatiques et des mesures permettant d'atténuer ces conséquences. En outre, il faut mettre un accent plus marqué sur les objectifs environnementaux dans la recherche et l'élaboration de politiques relatives aux systèmes alimentaires.

Les lacunes à combler et les problèmes à résoudre comprennent notamment des travaux de recherche visant à :

- donner la priorité à l'intégration de solutions durables (par exemple, émissions de carbone faibles ou nulles, production alimentaire nécessitant moins d'eau, réduction de l'utilisation de produits agrochimiques, sols sains, diversité biologique et qualité de l'air) dans les interventions et les mesures (par exemple, des indicateurs et des indices clés) relatives aux systèmes alimentaires dont l'efficacité dans l'atteinte des objectifs peut et doit être mesurée;
- renforcer les systèmes alimentaires et les politiques connexes pour les rendre mieux préparés, plus équitables et plus résistants aux menaces futures pour la santé mondiale et la durabilité de l'environnement;
- proposer des idées et des politiques nouvelles qui ne portent pas que sur la santé et la durabilité des systèmes alimentaires, mais aussi sur les avantages en aval pour la croissance et la prospérité économiques (ou vice versa);
- trouver des outils de mesure et d'évaluation qui puissent aider les décideurs politiques à mieux comprendre les répercussions et les compromis multisectoriels des différentes voies politiques vers l'amélioration des systèmes alimentaires.

3) **Approfondir les dimensions de vulnérabilité et d'équité des systèmes alimentaires**

On fait de plus en plus d'études sur les dimensions sexospécifiques et autres dimensions intersectorielles des systèmes alimentaires, y compris leurs impacts différentiels sur différents groupes de population. La mise en place et la promotion de systèmes alimentaires sains et durables nécessitent la conception et la mise en œuvre de mesures, de structures et de politiques intersectorielles qui ne se limitent pas à la santé et à l'environnement, et englobent également les dimensions sociales et économiques, et les questions d'équité. Les conséquences prévues et imprévues des interventions sur les systèmes alimentaires doivent faire l'objet de recherches plus approfondies.

Les lacunes à combler et les problèmes à résoudre comprennent notamment des travaux de recherche visant à :

- comprendre comment les interventions stratégiques en faveur de l'équité économique et sociale peuvent avoir des répercussions positives sur les systèmes alimentaires et améliorer la santé et la durabilité de l'environnement;
- déterminer qui supporte le fardeau sanitaire et environnemental des systèmes alimentaires dans les PFR-PRI;
- identifier les personnes dont les droits sont respectés et dont les priorités sont prises en compte dans les systèmes alimentaires, tant dans leurs structures actuelles que dans les structures futures des systèmes alimentaires en mutation;
- garantir que la nourriture est produite, distribuée et consommée de manière durable et équitable afin de défendre le droit à l'alimentation pour tous;
- comprendre comment les différentes structures, politiques et modèles de systèmes alimentaires peuvent réduire ou accroître l'inégalité entre les sexes.

Considérations importantes : mieux reconstruire à la suite de la COVID-19

La pandémie de COVID-19, l'une des plus graves des cent dernières années, entraîne d'immenses défis pour la sécurité alimentaire et nutritionnelle, et devrait avoir des répercussions importantes et durables sur la santé des populations du monde entier. Elle révèle aussi des fractures profondes dans les systèmes sociaux, économiques, sanitaires et alimentaires du monde entier, et met en évidence des structures, des politiques et des pratiques non viables qui sont à l'origine d'une mauvaise santé mondiale et de la dégradation de l'environnement, et qui exacerbent les inégalités dont souffrent depuis longtemps les populations marginalisées. Forts d'un appui grandissant pour des changements majeurs à ces systèmes, les défenseurs de la santé mondiale et de l'environnement ont mis de l'avant l'idée de « mieux construire », en envisageant et en promouvant de profonds changements structurels nécessaires pour concrétiser leur vision d'un monde sain et équitable.

Bien qu'il ne s'agisse pas d'une orientation thématique dans le cadre de la présente demande de propositions, les idées de recherche doivent tenir compte des **répercussions de la pandémie de COVID-19 à l'échelle mondiale** et s'appuyer sur le discours mondial pour la « construction d'un monde meilleur » comme point de départ pour envisager l'avenir et promouvoir des changements novateurs et efficaces.

Exigences relatives à la présentation du dossier de candidature

Les candidats admissibles au concours doivent soumettre une **proposition d'idée de recherche (maximum 5 pages)** qui porte directement sur au moins l'un des trois thèmes susmentionnés, et qui vise à « mieux reconstruire à la suite de la COVID-19 ». En outre, *les candidats peuvent aussi fournir les détails d'au plus deux collaborateurs (optionnel)* lors du remplissage d'un [formulaire de demande](#) (téléchargeable). Veuillez noter que tous les candidats conserveront **toute la propriété intellectuelle de leur idée** et pourront la développer comme ils le souhaitent par la suite. Les candidats ne seront pas obligés de publier leur proposition dans le recueil d'idées.

Dans leur proposition d'idée de recherche, les candidats doivent :

- présenter un aperçu de l'état des connaissances sur leur sujet de recherche;
- expliquer pourquoi et comment la recherche sur ce sujet répond aux besoins et aux priorités de l'hémisphère sud, et en quoi des recherches approfondies pourraient inciter les bailleurs de fonds à considérer le sujet de recherche comme prioritaire;

- inclure une description de la théorie, du cadre et de l'approche méthodologique qui pourraient être utilisés pour décrire et étudier leur proposition;
- faire preuve de clarté et de justesse dans la gestion des questions liées à l'éthique de l'idée de recherche proposée;
- décrire les retombées attendues de la recherche dans ce domaine ainsi que les mesures et les approches qui pourraient être utilisées pour en mesurer les retombées.

En plus de la proposition, le dossier devrait comprendre *le CV du (de la) postulant(e) principal(e)* et une lettre d'appui d'un superviseur ou d'un mentor qui peut témoigner du potentiel de l'idée et du milieu de recherche où le ou la titulaire de bourse de recherche doctorale ou postdoctorale mène ses activités. Des chiffres, des cadres et des références scientifiques supplémentaires peuvent être ajoutés en annexe (maximum de trois annexes, qui ne sont pas comprises dans le nombre limite de pages de la proposition).

Processus de sélection

Les propositions reçues seront soumises à un processus d'examen en deux étapes :

Examen de l'admissibilité et de la pertinence

–L'idée proposée répond-elle à tous les critères d'admissibilité et de pertinence?

–L'idée s'inscrit-elle dans la portée, correspond-elle à une ou plusieurs des orientations thématiques et tient-elle compte des considérations essentielles du concours?

–L'idée est-elle appropriée et pertinente du point de vue du contexte local des PFR-PRI?

–Y a-t-il une explication claire quant à la valeur unique et nouvelle que cette idée apportera à la recherche sur les systèmes alimentaires et la durabilité?

– À qui l'idée proposée profitera-t-elle avant tout?

–L'idée vise-t-elle à améliorer l'équité et à réduire la vulnérabilité?

–L'idée prend-elle en compte les considérations éthiques?

–Le superviseur ou le mentor du candidat appuie-t-il l'idée proposée?

Examen technique approfondi

Un groupe de pairs évaluateurs qui possèdent une expertise pertinente dans les thèmes de l'appel de propositions évaluera les propositions en fonction des critères suivants :

Fondements théoriques et pratiques : L'idée est-elle fondée sur la compréhension théorique et pratique de la recherche, et est-elle bien étayée? L'état actuel des connaissances sur le sujet (c'est-à-dire la littérature scientifique et grise, des expériences de politiques documentées et des perspectives communautaires) est-il suffisamment bien décrit dans la proposition? La conception, l'analyse et la mise en œuvre de l'idée tiennent-elles compte du rôle du sexe, du genre et d'autres questions identitaires et expériences diverses? L'idée prend-elle en compte les considérations éthiques? La proposition tient-elle compte de la manière dont les groupes vulnérables ou marginalisés seront touchés par l'idée de recherche?

Faisabilité : L'idée a-t-elle une valeur pratique? Avec quelle facilité l'idée pourrait-elle être reprise par d'autres chercheurs et décideurs politiques des PFR-PRI, ou encore par des organismes subventionnaires et des organismes de développement qui prennent des mesures? Indique-t-on les acteurs qui doivent participer à la mise en œuvre de l'idée et explique-t-on comment on les incitera à participer, et comment leur participation sera coordonnée? Si la proposition ne peut pas être immédiatement mise en œuvre, y présente-t-on les principaux obstacles à son éventuelle mise en œuvre et les facteurs qui pourraient y contribuer, notamment le positionnement en vue d'avoir des retombées, les processus visant à encourager l'adoption et le soutien politique requis?

Mise à l'échelle : Dans quelle mesure l'idée pourrait-elle être mise à l'échelle ou mise en œuvre dans différentes régions géographiques, différents contextes sociopolitiques ou différentes municipalités, territoires, pays ou régions? Quelle est l'étendue possible des retombées? Comment l'idée sera-t-elle appliquée d'un point de vue social? S'agit-il seulement d'une solution technique, ou le contexte politique y est-il propice? Comment pourrait-on créer, soutenir et élargir des coalitions de changement?

Retombées et positionnement en vue de la transformation : Quelles seront les retombées de l'idée sur la promotion de systèmes alimentaires sains, équitables et durables? Quelle est la théorie du changement, et où l'idée s'inscrit-elle dans ce ou ces parcours? Comment les progrès et les changements seront-ils mesurés?

Dates à retenir

Date limite pour la présentation d'une idée de recherche : 11 décembre 2020

Les candidats retenus seront invités à approfondir leur idée avec un mentor : Février 2021

Colloque des idées (virtuel ou en personne) : Printemps 2021

Contact

Les demandes de renseignements concernant la demande de propositions et le processus de soumission doivent être envoyées par courriel à l'adresse idrc.researchideas@utoronto.ca

APPENDIX 3: AWARDEES' ANNOUNCEMENT (ENGLISH)

May 31st, 2021

Awardees : IDRC's 2020 Research Ideas Competition

Pursuing the co-benefits for Health and Environments through food system change

On behalf of Canada's International Development Research Centre (IDRC) as administered by the University of Toronto's Dalla Lana School of Public Health, seven awardees for the [Research Ideas Competition](#) have been identified given the available funding envelope, a strong pool of applicants, the consideration of health and environmental co-benefits, and the ranking of proposals by our interdisciplinary peer-review Committee following a rigorous and fair peer review process using the published criteria of the Research Ideas Competition.

The awardees (listed in no particular order) consist of:

Title	Research Idea Location	Awardee Details
Interlinkages between food systems, health risks and environmental dimensions in Sri Lanka: A machine learning approach	Sri Lanka	Kanchana Wickramasinghe PhD Student Griffith University
Generating inclusive governance for Latin American and Caribbean urban food markets: potentials drivers and barriers	Latin America and Caribbean countries	David Smith Post-doctoral Fellow Université de Montréal
Understanding the Intersections between Food Sovereignty, Food Security, and the Sustainability of Africa's Food Systems during and beyond COVID-19: A comparison of Botswana and South Africa.	Botswana and South Africa	Tebogo Thandie Leepile PhD Student University of British Columbia
Nutrition upgrade to forest conservation	Madagascar	Ranaivo Andriarilala Rasolofoson Post-doctoral Fellow Cornell University
Smart Toolbox for practitioners looking to improve local food systems: A collaborative and convergent research initiative	Colombia	Jenny Melo Velasco PhD Student University of Missouri-Columbia
Consumer Behaviour for Sustainable Healthy Diets: Understand underlying motivations for current food preferences in South Africa	South Africa	Chuma Banji Chinzila Post-doctoral Fellow University of KwaZulu-Natal

Exploring the Double Burden of Malnutrition in Children and Adolescents in Low- and Middle-Income Countries through the Lens of the Food Environment: A Mixed-Methods Approach	Still to be determined which low- and middle-income countries	Bianca Carducci PhD Student University of Toronto
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Next, the IDRC with support from the University of Toronto’s Dalla Lana School of Public Health will be working with awardees on further strengthening their research idea through a forum for capacity building and mentorship. Furthermore, a virtual symposium addressing the theme of “Pursuing the co-benefits for Health and Environments through food system change” is tentatively organized for the end of September 2021.

On behalf of the IDRC, we would like to thank all applicants for their interest in IDRC’s [Research Ideas Competition](#).

Sincerely,

Erica Di Ruggiero, MHSc PhD RD

Associate Professor of Global Health
Social & Behavioural Health Sciences Division &
Institute of Health Policy, Management & Evaluation
Director, Centre for Global Health
Director, Collaborative Specialization in Global Health
Dalla Lana School of Public Health | University of Toronto

Daniel Sellen, PhD

Distinguished Professor, Anthropology and Global Health,
Faculty of Arts and Sciences
Professor, Nutritional Sciences and Director, The Joanna and
Brian Lawson Centre for Child Nutrition, Temerty Faculty of
Medicine | University of Toronto

APPENDIX 4: AWARDEES' ANNOUNCEMENT (FRENCH)

Le 31 mai 2021

Lauréat(e)s : Concours d'idées de recherche 2020

Obtenir des avantages pour la santé et l'environnement en modifiant le système alimentaire

Au nom du Centre de recherches pour le développement international (CRDI) du Canada, tel qu'administré par l'École de Santé Publique Dalla Lana de l'Université de Toronto, sept lauréat(e)s du Concours d'idées de recherche ont été identifié(e)s. La sélection de ces lauréat(e)s a pris en compte l'examen des avantages en matière de santé et d'environnement, la richesse des propositions et leur classement par notre comité interdisciplinaire d'évaluateurs à la suite d'un processus rigoureux et équitable en conformité avec les critères publiés du Concours d'idées de recherche, et enfin le financement disponible.

Les lauréat(e)s sont les suivant(e)s (sans ordre particulier) :

Titre	Emplacement de l'idée de recherche	Détails du lauréat(e)
Interconnexions entre les systèmes alimentaires, les risques pour la santé et les dimensions environnementales au Sri Lanka : une approche d'apprentissage automatique	Sri Lanka	Kanchana Wickramasinghe Doctorante Université Griffith
Générer une gouvernance inclusive pour les marchés alimentaires urbains d'Amérique latine et des Caraïbes : contributeurs et obstacles potentiels	Pays d'Amérique latine et des Caraïbes	David Smith Boursier postdoctoral Université de Montréal
Comprendre les intersections entre la souveraineté alimentaire, la sécurité alimentaire et la durabilité des systèmes alimentaires africains pendant et au-delà du COVID-19; Une comparaison du Botswana et de l'Afrique du Sud.	Botswana et Afrique du Sud	Tebogo Thandie Leepile Doctorante Université de la Colombie-Britannique
Mise à niveau nutritionnelle de la conservation des forêts	Madagascar	Ranaivo Andriarilala Rasolofoson Boursier postdoctoral Université Cornell
Boîte à outils intelligente pour les praticiens qui cherchent à améliorer les systèmes alimentaires locaux : une initiative de recherche collaborative et convergente	Colombie	Jenny Melo Velasco Doctorante Université de Missouri-Columbia
Comportement des consommateurs pour une alimentation saine durable : comprendre les motivations sous-jacentes des préférences alimentaires actuelles en Afrique du Sud	Afrique du Sud	Chuma Banji Chinzila Boursière postdoctorale Université de KwaZulu-Natal

<p>Explorer le double fardeau de la malnutrition chez les enfants et les adolescents dans les pays à revenu faible ou intermédiaire à travers l'objectif de l'environnement alimentaire : une approche à méthodes mixtes</p>	<p>Reste à déterminer quels pays à faible revenu et à revenu intermédiaire</p>	<p>Bianca Carducci Doctorante Université de Toronto</p>
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Le CRDI, avec l'appui de l'École de Santé Publique Dalla Lana de l'Université de Toronto, travaillera ensuite avec les lauréat(e)s pour développer davantage leur idée de recherche par le biais d'un forum qui aura comme but de renforcer les capacités ainsi que le mentorat. En outre, un symposium virtuel sur le thème « Obtenir des avantages pour la santé et l'environnement en modifiant le système alimentaire » est provisoirement organisé pour la fin septembre 2021.

Au nom du CRDI, nous tenons à remercier tous les postulant(e)s pour leur intérêt dans le [Concours d'idées de recherche](#).

Sincères salutations,

Erica Di Ruggiero, MHS PhD RD

Associate Professor of Global Health
Social & Behavioural Health Sciences Division &
Institute of Health Policy, Management & Evaluation
Director, Centre for Global Health
Director, Collaborative Specialization in Global Health
Dalla Lana School of Public Health | University of Toronto

Daniel Sellen, PhD

Distinguished Professor, Anthropology and Global Health,
Faculty of Arts and Sciences
Professor, Nutritional Sciences and Director, The Joannah
and Brian Lawson Centre for Child Nutrition, Temerty Faculty
of Medicine | University of Toronto

APPENDIX 5: FREQUENTLY ASKED QUESTIONS (ENGLISH/FRENCH)

<p>FAQs : Research Ideas Competition : Pursuing the co-benefits for Health and Environments through food system change</p>	<p>FAQ : Concours d'idées de recherche sur le thème : Obtenir des avantages pour la santé et l'environnement en modifiant le système alimentaire</p>
<p><i>Who is eligible to submit an application?</i></p>	<p><i>Qui est admissible pour soumettre une demande de proposition?</i></p>
<p>The primary applicant must be a Doctoral Student or Post-Doctoral Fellow that is Canadian, permanent resident of Canada, or citizen of low- and middle-income countries currently enrolled in a doctoral degree or post-doctoral fellowship program at a recognized university (not only universities in Canada). The primary applicant must meet this criteria; the applicant can also provide the details of up to two co-collaborators (optional) and their affiliations in their application. This is the list of eligible low- and middle-income countries: http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-of-ODA-Recipients-for-reporting-2020-flows.pdf</p>	<p>Le(a) postulant(e) principal(e) doit être un(e) étudiant(e) en doctorat ou boursier(ère) de recherches postdoctorales qui est soit Canadien, résident permanent du Canada, ou citoyen d'un pays à faible revenu et à revenu intermédiaires (PFR-PRI) présentement inscrit(e) pour un diplôme de doctorat ou disposant d'une bourse de recherche postdoctorale auprès d'une université reconnue (cela peut être en dehors du Canada). Le(a) postulant(e) principal(e) doit se conformer à ces critères d'admissibilité; il(elle) peut aussi fournir les détails d'au plus deux collaborateurs (optionnel) dans le formulaire de demande de proposition. Ci-après, la liste (en anglais) des PFR-PRI éligibles: http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-of-ODA-Recipients-for-reporting-2020-flows.pdf</p>
<p><i>How will the award be administered?</i></p>	<p><i>Comment le prix sera-t-il administré ?</i></p>
<p>The primary applicant will receive an award of \$10,000 CAD administered directly to that individual. Clarity on how the award would be split between co-collaborators (if any) is encouraged prior to submission.</p>	<p>Le(a) postulant(e) principal(e) recevra 10 000 \$ CAD pour l'idée de recherche gagnante qui lui seront versés directement. Le(a) postulant(e) principal(e) recevra 10 000 \$ CAD pour l'idée de recherche gagnante qui lui seront versés directement. Clarifiez avant la soumission de proposition comment ce prix serait divisé entre les collaborateurs (si besoin).</p>
<p><i>If your research idea receives a winning award, are you expected to implement the research idea?</i></p>	<p><i>Si votre idée de recherche reçoit un prix gagnant, êtes-vous censé mettre en œuvre l'idée de recherche?</i></p>

<p>The award of \$10,000 CAD is just for the winning research idea; there aren't any requirements to implement this research idea with this award.</p>	<p>La récompense de \$10,000 CAD sera remise seulement pour l'idée de recherche gagnante; il n'y aucune exigence pour mettre en œuvre l'idée de recherche avec ce prix.</p>
<p>What are the criteria to be considered a <i>recognized university</i>?</p>	<p>Quels sont les critères à considérer <i>pour appartenir à une université reconnue</i>?</p>
<p>A recognized university is one that is approved, by a higher education accrediting body in that country, to issue degrees. In Canada, authority is granted at the provincial or territorial level: https://www.univcan.ca/universities/quality-assurance/provincial-quality-assurance-systems/. If questions still remain on whether your university can be considered, please write to idrc.researchideas@utoronto.ca to check the International Credentials Equivalencies database.</p>	<p>Une université reconnue est une université qui est approuvée par un organisme d'accréditation de l'enseignement supérieur du pays pour délivrer des diplômes. Au Canada, l'autorité est accordée au niveau provincial ou territorial : https://www.univcan.ca/universities/quality-assurance/provincial-quality-assurance-systems/. Si vous avez toujours des questions quant à savoir si votre université peut être considérée, veuillez écrire à idrc.researchideas@utoronto.ca pour une vérification dans la base de données des équivalences de titres de compétences internationales.</p>
<p>What disciplines are accepted for this call?</p>	<p><i>Quelles matières sont acceptées pour la demande à propositions?</i></p>

<p>This Call for Research Ideas is inclusive of all disciplines that align with the scope, clarity and appropriateness of ethical considerations, and at least one of the three thematic directions of the Call (with the option to address multiple thematic directions if relevant). The proposed idea must outline a brief overview of the state of knowledge, why and how research on this topic responds to the needs and priorities of the Global South, and how further research could help priority setting with donors. A description of the theory, framework and/or methodological approach which could be used to describe and investigate this Research Idea is required, along with details on the expected impact of research into this area as well as metrics or approaches that could be used to measure its impact. Lastly, the Research Idea should be grounded in the current global realities resulting from the COVID-19 pandemic.</p>	<p>Cette demande à propositions d'idées de recherche englobe toutes les matières qui s'alignent sur la portée, la clarté, la pertinence des considérations éthiques et au moins l'un des trois thèmes de l'appel (avec la possibilité d'aborder plusieurs orientations thématiques, le cas échéant). L'idée de recherche proposée doit présenter un aperçu de l'état des connaissances sur le sujet de recherche, expliquer pourquoi et comment la recherche sur ce sujet répond aux besoins et aux priorités de l'hémisphère sud, et en quoi des recherches approfondies pourraient inciter les bailleurs de fonds à considérer le sujet de recherche comme prioritaire. Une description de la théorie, du cadre et de l'approche méthodologique qui pourraient être utilisés pour caractériser et étudier la proposition est requise, avec une description des retombées attendues de la recherche dans ce domaine ainsi que les mesures et approches qui pourraient être utilisées pour en évaluer les retombées. Finalement, l'idée de recherche doit tenir compte des répercussions de la pandémie de COVID-19 à l'échelle mondiale.</p>
<p><i>Is a financial proposal required for this Call?</i></p>	<p><i>Une proposition financière est-elle nécessaire pour cette demande à propositions?</i></p>
<p>No - given the nature of this Research Ideas competition and winning awards, there isn't any financial budget (including overhead-indirect costs) required.</p>	<p>Non - étant donnée la nature du concours d'idées de recherche et les prix gagnants, aucun budget financier (y compris les overheads) n'est requis.</p>
<p><i>What should be included in your application?</i></p>	<p><i>Qu'est-ce qui doit être inclus dans votre demande?</i></p>
<p>Your application is ready for submission when it includes these four components:</p> <ul style="list-style-type: none"> • a proposal (maximum 5 pages) of a research idea which directly addresses at least one of the three aforementioned thematic directions, and is informed by the key consideration of 'building better from COVID-19'; • CV of primary applicant ; • a completed application form ; • a letter of support from your supervisor. 	<p>Votre demande est prête à être soumise lorsqu'elle comprend les quatre composantes suivantes :</p> <ul style="list-style-type: none"> • une proposition d'idée de recherche (maximum, 5 pages) qui porte directement sur au moins l'un des trois thèmes susmentionnés, et qui vise à « mieux reconstruire à la suite de la COVID-19 »; • CV du (de la) postulant(e) principal(e) ; • un formulaire de demande complété; • une lettre de soutien d'un superviseur ou mentor.