Innovative Methods and Metrics for Agriculture and Nutrition Actions (IMMANA) is a research initiative funded by UKaid from the UK Government Department for International Development. IMMANA aims to accelerate the development of a robust scientific evidence base needed to guide changes in global agriculture and food systems to feed the world's population in a way that is both healthy and sustainable.

IMMANA consists of three interrelated workstreams:

• Competitive Research Grants to Develop Innovative Methods and Metrics for Agriculture and Nutrition Actions (Grants)
• Post-Doctoral Fellowships for Emerging Leaders in Agriculture, Nutrition, and Health Research (Fellowships)
• Agriculture, Nutrition & Health Academy: a global agriculture and food systems research network for improved nutrition and health.

For more information, please see our website: http://immana.lcirah.ac.uk/
Grants

- **Probabilistic Causal Models**
  Principal investigator: Eike Luedeling, ICRAF
  Uganda, Kenya
  Use Bayesian networks methods to evaluate the projected impacts of two agricultural interventions on nutrition outcomes

- **Women’s Empowerment in Nutrition Index (WENI)**
  Principal investigators: Sudha Narayanan, Indira Gandhi Institute of Development Research; Erin Lentz, University of Texas at Austin
  Co-principal investigator: Marzia Fontana, Independent Consultant
  India, Bangladesh
  Develop a new metric to assess women’s nutritional empowerment by assessing factors, such as household dynamics, nutritional knowledge, time use, and food access

- **Leveraging value chains to improve nutrition**
  Principal investigator: Aulo Gelli, IFPRI
  Malawi
  Implement a multidisciplinary framework for designing and evaluating World Food Programme interventions to improve value chains for nutritious foods

- **Women’s empowerment in livestock-focused agriculture**
  Principal investigator: Amy Webb Girard, Emory University
  Uganda, Tanzania, Ethiopia
  Develop, test, and promote uptake of a novel women’s empowerment metric focused on livestock production and maternal and child nutrition

- **Surveillance of Climate-Smart Agriculture for Nutrition (SCAN)**
  Principal investigator: Todd Rosenstock, ICRAF
  Uganda, Kenya
  Build a nutrition surveillance system using mobile phones and develop and test a multidimensional metric for monitoring the nutrition outcomes of agricultural interventions

- **Indicators of Affordability of Nutritious Diets in Africa (IANDA)**
  Principal investigators: Jennifer Coates, Tufts University; Anna Herforth, Independent Consultant
  Ghana and Tanzania
  Develop, test, and promote uptake of a set of food affordability metrics using existing food price data collected by national statistics and agricultural organizations

**Above (left to right)**
IMMANA Grantee Sera Young explains her novel measure for water insecurity at the 2018 ANH Academy Week in Accra, Ghana.
<table>
<thead>
<tr>
<th>Study Title</th>
<th>Principal Investigator(s)</th>
<th>Country(ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring the livelihoods of smallholder farmers and linkages to nutrition</td>
<td>Andrew Jones, University of Michigan</td>
<td>Burkina Faso</td>
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<tr>
<td>Nutritional Postharvest Loss (NUTRI-P-LOSS)</td>
<td>Aurelie Bechoff, Natural Resources Institute, University of Greenwich</td>
<td>Zimbabwe, Uganda</td>
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<tr>
<td>Assessing household-level water insecurity</td>
<td>Sera Young, Northwestern University</td>
<td>Bangladesh, Brazil, Guatemala, Kenya, Nepal, Tajikistan</td>
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<td>New tools for measuring energy expenditure</td>
<td>Giacomo Zanello, University of Reading</td>
<td>Ghana, India, Nepal</td>
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<tr>
<td>Intra-household dynamics impact nutrition in agricultural households</td>
<td>Jennifer Twyman, CIAT</td>
<td>Guatemala</td>
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<tr>
<td>Information communication technologies for women’s agriculture time use and child nutrition</td>
<td>Kate Weiland, Natural Resources Institute, University of Greenwich</td>
<td>Uganda</td>
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<tr>
<td>Rapid assessment tool for nutrient gaps in food systems</td>
<td>Elaine Ferguson, LSHTM</td>
<td>Africa, Asia, and Latin America</td>
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<td>Aquatic food for health and nutrition</td>
<td>David Little, University of Stirling</td>
<td>Bangladesh, Cambodia</td>
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<td>Enriching fruit and vegetable consumption</td>
<td>Ruerd Ruben and Ireen Raaijmakers, Wageningen Economic Research</td>
<td>Kenya</td>
</tr>
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</table>

**Intra-household dynamics impact nutrition in agricultural households**
Principal investigator: Jennifer Twyman, CIAT
Co-principal investigator: Pilar Useche, University of Florida
Guatemala

Identify factors associated with household-level decision-making affecting food consumption and diet quality.

**Information communication technologies for women’s agriculture time use and child nutrition**
Principal investigator: Kate Weiland, Natural Resources Institute, University of Greenwich
Uganda

Scope: Validate wearable cameras and voice response capture to measure women’s time use and infant feeding practices in agricultural settings.

**Rapid assessment tool for nutrient gaps in food systems**
Principal investigator: Elaine Ferguson, LSHTM
Africa, Asia, and Latin America
Build Agrifood, a software tool based on linear programming designed to identify nutrition gaps and appropriate policy responses.

**Aquatic food for health and nutrition**
Principal investigator: David Little, University of Stirling
Bangladesh, Cambodia
Develop and validate a metric describing the influence of access to aquatic foods on the nutrition and health statuses of adolescent girls.

**Enriching fruit and vegetable consumption**
Principal investigator: Ruerd Ruben and Ireen Raaijmakers, Wageningen Economic Research
Kenya
Develop and validate metrics and tools that assess factors associated with fruit and vegetable consumption for urban African contexts.

**Assessing household-level water insecurity**
Principal investigator: Sera Young, Northwestern University

Refine and validate a novel scale for assessing water insecurity designed for implementation across diverse global contexts.

**New tools for measuring energy expenditure**
Principal investigator: Giacomo Zanello, University of Reading

Develop and test new methods for estimating energy expenditure in rural agriculture households using accelerometer technology.

**Above (left to right)**
Andrea Spray shows how innovations in information communication technologies can be leveraged for better data collection.
IMMANA Grantee Anna Herforth learns about the mobile phone data collection systems used by Tanzanian market managers.
Mieghan Bruce  
**Tanzania**  
Apply a system dynamics methodology to evaluate a randomized controlled trial livestock health intervention on child diets and nutrition

Rosemary Isoto  
**Uganda**  
Develop statistical models of the relationships between nutrient intake and smallholder farm labor productivity in women using nationally-representative panel data

Matilda Laar  
**Ghana**  
Develop and test a monitoring and evaluation toolkit incorporating agricultural and child nutrition indicators for the Ghana School Feeding Programme

Cynthia Matare  
**Zambia**  
Develop and validate culturally-sensitive survey tool to rapidly assess women’s time use in agricultural settings

Bekele Megersa  
**Ethiopia**  
Estimate the contribution of milk to cereal-based, low diversity diets among children in pastoral Ethiopia

Nitya Mittal  
**India**  
Identify household-level determinants of calorie sufficiency and diet quality among individual children to understand intra-household allocation of food

Kafui Adjaye-Gbewonyo  
**Sub-Saharan Africa**  
Develop and test an approach to measuring the impact of longitudinal changes to national agricultural trade policy on child nutrition for evaluating structural adjustment programs

Semira Mohammed Beyan  
**Ethiopia**  
Develop a case study of soil health, food composition, diets, and nutrition for one rural agricultural community in Ethiopia

Mohammed Husein  
**Ghana**  
Adapt the Wechler Abbreviated Scale Intelligence (WASI), a standard tool for measuring cognitive function, for rural agricultural contexts, and test its effectiveness by evaluating the long-term impacts of a successful agriculture and nutrition intervention

**ABOVE (LEFT TO RIGHT)**  
IMMANA Fellowships meets in Addis Ababa, Ethiopia at the 2016 ANH Academy Week. From left to right: Nitya Mittal, Mieghan Bruce, Bekele Megersa, Matilda Laar, Cynthia Matare, Rosemary Isoto, Semira Mohammed Beyan.

**Anjali Rao participates in a Learning Lab at the 2018 ANH Academy Week in Accra, Ghana**
Abu Hayat Md. Saiful Islam
Bangladesh
Use panel data from Bangladesh to assess the relationship between farm crop diversity changes to household and women’s diet diversity.

Sukhwinder Singh
India
Compare the linkages between farm, crop, and livelihood diversity and farmer nutrition in two states in India: Gujarat and Punjab.

Taddese Alemu Zerfu
Ethiopia
Identify and characterize diet-related factors associated with maternal anemia and associated adverse pregnancy outcomes.

Zeweter Abebe
Ethiopia
Develop a statistical model describing the effects of home gardening on vitamin A levels in breastmilk and infant vitamin A intake.

Christopher Conz
Lesotho
Construct a historical narrative of the social, policy, and environmental forces driving pellagra outbreaks in Lesotho during 1965 to 1965.

Aissatou Ouedraogo
Burkina Faso
Examine the role of social networks in diffusion and uptake of nutrition and health knowledge in agricultural settings in Burkina Faso.

Thalia Sparling
Bangladesh
Develop and test statistical indicators to predict the impact of effective delivery of agricultural interventions on improving maternal and child diets.

Julia de Bruyn
Tanzania
Test the effectiveness of a pictorial-based tool for collecting dietary data in livestock-based agricultural settings.

Selma Gicevic
Tanzania
Develop a diet assessment tool based on the Prime Diet Quality Score (PDQS) and refine and validate the measure against 24-hour recall data.

Laura Hackl
Tanzania
Use iron isotopes to measure the transition of maternal dietary iron to infants through breastfeeding while controlling for inflammation status.

Molly Muleya
Zimbabwe
Determine the mineral bioaccessibility of cereal and legume crops under different local agronomic management strategies.

ABOVE (LEFT TO RIGHT)
Round 1 Fellow Matilda Laar gives her keynote speech at the 2018 Agriculture, Nutrition & Health (ANH) Academy Week in Accra, Ghana.
ANH Academy
Working Groups

**Economic Evaluations**
Coordinators: Carol Levin, University of Washington; William Masters, Tufts University
Scope: Define uses of economic evaluation data for stakeholders and provide guidance on methods applicable to a variety of contexts

**Food Environments**
Coordinators: Christopher Turner and Suneetha Kadiyala, LSHTM
Scope: Review and synthesize working definitions, key concepts, methodological approaches, and current research gaps on food environment research in low- and middle-income countries

**Food Safety**
Coordinator: Delia Grace
Scope: Review existing food safety metrics and methods, identify critical gaps, and propose new approaches or refinements to strengthen research

**Sustainable Diets**
Coordinators: Edward Joy and Suneetha Kadiyala, LSHTM
Scope: Develop a live social game to engage researchers, policymakers, and key stakeholders on generating and informing policies for healthy, sustainable food systems
Key Papers

Grants


Fellowships


