



immana at a glance

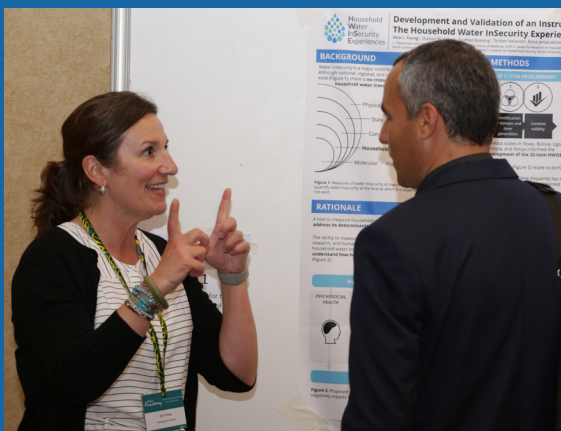
Innovative Methods & Metrics for
Agriculture and Nutrition Actions

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.

IMMANA Grants and Fellowships present at the 2017 ANH Academy Week in Kathmandu, Nepal. From left to right: Eike Luedeling, Nanna Roos, Amy Webb Girard, Abu Hayat Md. Saiful Islam, Sukhwinder Singh, Aurelie Bechoff



Metrics



Methods



Tools

Measuring the livelihoods of smallholder farmers and linkages to nutrition

Principal investigator: Andrew Jones,
University of Michigan

 Burkina Faso

Assess the linkages between smallholder farmer livelihoods and evaluate the performance of different agricultural surveys for nutrition through a randomized controlled trial

Nutrition Postharvest Loss (NUTRI-P-LOSS)


Principal investigator: Aurelie Bechoff,
Natural Resources Institute, University of
Greenwich

Zimbabwe, Uganda

Develop a method and tool for estimating the nutritional losses of staple food crops along postharvest value chains

Assessing household-level water insecurity

Principal investigator: Sera Young,
Northwestern University

 Bangladesh, Brazil, Guatemala,
Kenya, Nepal, Tajikistan

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

 Ghana, India, Nepal

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

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 Wellard,
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

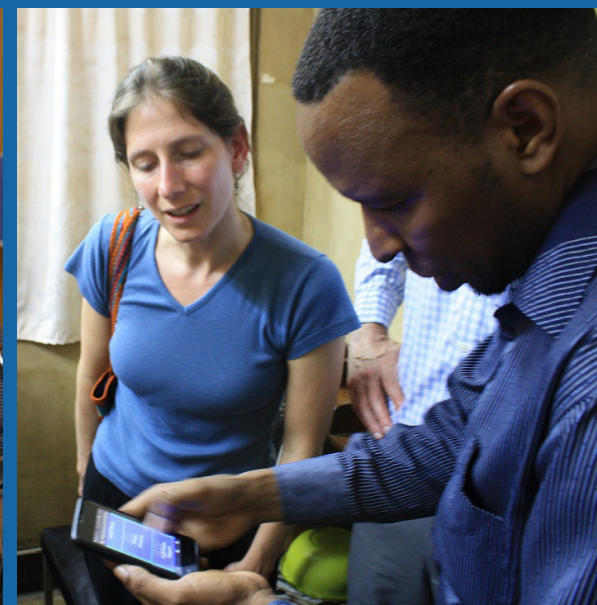
Develop and validate a metric describing the influence of access to aquatic foods on the nutrition and health statuses of adolescent girls

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



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.



Fellowships



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



Metrics



Methods



Tools



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 Konz

 Lesotho

Construct a historical narrative of the social, policy, and environmental forces driving pellagra outbreaks in Lesotho during 1955 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)

IMMANA Fellowships meet in Kathmandu, Nepal at the 2017 ANH Academy Week. From left to right: Sukhwinder Singh, Caitlin Joseph, Zachary Gersten, Kafui Adjaye-Gbewonyo, Mohammed Husein, William Masters, Abu Hayat Md. Saiful Islam.

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

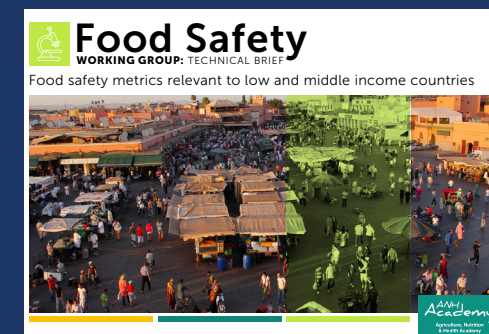
Scope: Define uses of economic evaluation data for stakeholders and provide guidance on methods applicable to a variety of contexts



Food Safety

Coordinator: Delia Grace

Scope: Review existing food safety metrics and methods, identify critical gaps, and propose new approaches or refinements to strengthen research



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



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

Whitney, C.W., Lazanova, D., Muchiri, C., Shepherd, K.D., Rosenstock, T.S., Krawinkel, M., Tabuti, J.R.S., & Luedeling, E. (2018). Probabilistic decision tools for determining impacts of agricultural development policy on household nutrition. *Earth's Future*, 6, 359-372. DOI:10.1002/2017EF000765.

Whitney, CW, Shepherd K D, Rosenstock T S, & Luedeling E. (2018). Decision Analysis to Support Agriculture for Nutrition. ICRAF Policy Brief no 38. World Agroforestry Centre, Nairobi, Kenya.

Whitney, C.W., Tabuti, J.R.S., Hensel, O., Yeh, C.-h., Gebauer, J., and Luedeling, E. (2017). Homegardens and the future of food and nutrition security in southwest Uganda. *Agricultural Systems*, 154, 133-144. DOI:10.1016/j.agsy.2017.03.009.

Whitney, C.W., Luedeling, E., Tabuti, J.R.S., Nyamukuru, A., Hensel, O., Gebauer, J., & Kehlenbeck, K. (2018). Crop diversity in homegardens of southwest Uganda and its importance for rural livelihoods. *Agriculture and Human Values*. DOI:10.1007/s10460-017-9835-3.

Whitney, C.W., Bahati, J., & Gebauer, J. (2018). Ethnobotany and agrobiodiversity; valuation of plants in the homegardens of southwestern Uganda. *Ethnobiology Letters* 9(2): 90–100.

Whitney, C.W., Shepherd K.D., Krawinkel, M., & Luedeling, E. (2018). Integration of Fruit Trees into Agricultural Landscapes of Kenya can Help Enhance Nutrition Security. ICRAF Policy Brief no 40. World Agroforestry Centre, Nairobi, Kenya.

Whitney, C.W., Shepherd K.D., Rosenstock T.S., & Luedeling, E. (2018). Decision Analysis to Support Agriculture for Nutrition. ICRAF Policy Brief no 38. World Agroforestry Centre, Nairobi, Kenya.

Whitney, C.W., Shepherd, K.D., Rosenstock, T.S., Krawinkel, M., & Luedeling, E. (2018). Modelling the Impacts of Uganda's Vision 2040 Policy on Household Nutrition. ICRAF Policy Brief no 39. World Agroforestry Centre, Nairobi, Kenya.

Lentz, E.C. (2018). Complicating narratives of women's food and nutrition insecurity: domestic violence in rural Bangladesh. *World Development*. 104: 271-280. DOI:10.1016/j.worlddev.2017.11.019

Narayanan, S., Fontana, M., Lentz, E.C., & Kulkarni, B. (2017). Rural Women's Empowerment in Nutrition: a proposal for diagnostic linking food, health, and institutions." Prepared for United Nations Women: Expert Group Meeting on 'Challenges and opportunities in achieving gender equality and the empowerment of rural women and girls.'

Available from: <http://www.unwomen.org/-/media/headquarters/attachments/sections/csw/62/egm/rural%20womens%20empowerment%20in%20nutritionnarayanan%20fontana%20lentz%20and%20kulkarnifinal.pdf?la=en&vs=2753>

Gelli, A., Aberman, N.-L., Margolies, A., Santacroce, M., Baulch, B., & Chirwa, E. (2017). Lean-Season Food Transfers Affect Children's Diets and Household Food Security: Evidence from a Quasi-Experiment in Malawi. *The Journal of Nutrition*, 147(5): 869-878. DOI:10.3945/jn.116.246652.

de la Peña, I., Garrett, J., & Gelli, A. (2018). Nutrition-sensitive value chains from a smallholder perspective. IFAD Research Series 30. International Fund for Agricultural Development, Rome, Italy.

Miedema, S.S., Haardörfer, R., Webb Girard, A., & Yount, K.M. (2018). Measurement invariance of women's empowerment in East Africa. *World Development*, 110: 453-464. DOI:10.1016/j.worlddev.2018.05.031.

Galie, A., Webb Girard, A., Baltenweck, I., Dominguez-Salas, P., Jones, R., Korir, L., Raskind, I., Smith K., Teufel, N. & Yount, K.M. Women's empowerment, food security and forage in pastoral communities of Tanzania. *Global Food Security*, 23: 125-134.

Galie, A., Korir, L., Teufel, N., Baltenweck, I., Webb Girard, A., & Yount, K. (2018). The Women's Empowerment in Livestock Index. Social Indicators Research. DOI:10.1007/s11205-018-1934-z.

Lamanna, C., Hachethu, K., Chesterman, S., Singhal, G., Mwongela, B., Ng'endo, M., Passeri, S., Farhikhtah, A., Kadiyala, S., Bauer, J.-M., & Rosenstock, T.S. (2019). Strengths and limitations of computer assisted telephone interviews (CATI) for nutrition data collection in rural Kenya. *PLOS One*, 14(1). DOI:10.1371/journal.pone.0210050

Rosenstock, T.S., Lamanna, C., Chesterman, S., Hammond, J., Kadiyala, S., Luedeling, E., Shepherd, K., Derenzi, B., & van Wijk, M.T. (2017). When less is more: innovations for tracking progress toward global targets *Current Opinion in Environmental Sustainability*, 26–27: 54-61. DOI: 10.1016/j.cosust.2017.02.010

Masters, W.A., Bai, Y., Herforth, A., Sarpong, D.B., Mishili, F., Kinabo, J. & Coates, J.C. (2017). Measuring the Cost of Dietary Diversity: Novel Price Indexes to Monitor Access to Nutritious Diets. SSRN Electronic Journal. Available at: <https://ssrn.com/abstract=2970745>

Cost of Nutritious Diets Consortium (2018). Indicators and tools for the cost of nutritious diets. Boston, MA: Tufts University (13 pages, 31 May 2018).

Dillon, A., Jones, A.D., & Mensah, E. (2018). Proxy biases in agricultural statistics. IFPRI, AMD Seminar Series. Available from: https://amdseminarseries.files.wordpress.com/2018/05/effects-of-survey-design-methods-on-agricultural-outcomes_4_29_2018.pdf

Somé, J.W., & Jones, A.D. (2018). The influence of crop production and socioeconomic factors on seasonal household dietary diversity in Burkina Faso. *PLoS One*, 13(5): e0195685. DOI:10.1371/journal.pone.0195685

Young S.L., Collins, S.M., Boateng, G.O., Neilands, T.B., Jamaluddine, Z., Miller, J.D., Brewis, A.A., Frongillo, E.A., Jepson, W.E., Melgar-Quinonez, H., Schuster, R.C., Stoler, J.B., & Wutich, A.; HWISE Research Coordination Network. Development and validation protocol for an instrument to measure household water insecurity across cultures and ecologies: the Household Water InSecurity Experiences (HWISE) Scale. *BMJ Open*, 9(1): e023558. DOI:10.1136/bmjopen-2018-023558.

Brewis, A.A., Rosinger, A., Wutich, A., Adams, E., Cronk, L., Pearson, A., Workman, C., & Young, S.L.; HWISE Research Coordination Network. (2019). Water sharing, reciprocity, and need: A comparative study of interhousehold water transfers in sub-Saharan Africa. *Economic Anthropology*, 6(2): 208-221. DOI:10.1002/sea2.12143.

Stoler, J.B., Brewis, A.A., Harris, L.M., Wutich, A., Pearson, A.L., Rosinger, A.Y., Schuster, R.C., & Young, S.L. (2019).

Household water sharing: a missing link in international health. *International Health*, 11(3): 163-165. DOI:10.1093/inthealth/ihy094

Zanello, G., Srinivasan, C.S., Picchioni, F., Webb, P., Nkegbe, P., Cherukuri, R., Neupane, S., Ustarz, Y., Gowdru, N., Neupane, S., & Wyatt, A.J. (2018). Using Accelerometers in Low- and Middle-Income Countries: A Field Manual for Practitioners. University of Reading. Reading (UK).

Zanello, G., Srinivasan, C.S., & Nkegbe, P. (2017). Piloting the use of accelerometry devices to capture energy expenditure in agricultural and rural livelihoods: Protocols and findings from northern Ghana. *Development Engineering* 2, 114-131. DOI:10.1016/j.deveng.2017.10.001.

Muriel, J., Twyman, J., Lopera, D.C., Useche, P., Gonzalez, C., Talsma, E.F., & Cosenza, E.L. (2019). His and Hers, time and income: How intra-household dynamics impact nutrition in agricultural households. Methods guide: Designing and implementation of data collection tools. Cali, Colombia: International Center for Tropical Agriculture (CIAT) (52 pages).

Muriel, J., Twyman, J., Useche, P., Lopera, D.C., Gonzalez, C., & Talsma, E.F. (2019). The Abbreviated Women's Empowerment in Agriculture Index (A-WEIA). Project results for "His and Hers, time and income: How intra-household dynamics impact nutrition in agricultural households". Cali, Colombia: International Center for Tropical Agriculture (CIAT) (5 pages).

Cosenza, E.L., Arora, D., Twyman, J., Useche, P., Gonzalez, C., Lopera, D.C., & Talsma, E. (2019). Nutritional status of adults and children under 5 years of age in two areas of Guatemala Project results for "His and Hers, time and income: how intra-household dynamics impact nutrition in agricultural households". Cali, Colombia: International Center for Tropical Agriculture (CIAT) (5 pages).

Lopera, D.C.; Gonzalez, C.; Twyman, J.; Useche, P. & Talsma, E.F. (2019). Household Food Security: Project results for "His and Hers, time and income: how intra-household dynamics impact nutrition in agricultural households". Cali, Colombia: International Center for Tropical Agriculture (CIAT) (7 pages).

Fellowships

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Adjaye-Gbewonyo et al. (2019) Agricultural trade policies and child nutrition in low- and middle-income countries: a cross-national analysis. *BMC Globalization and Health*, 15(21). DOI:10.1186/s12992-019-0463-0

Islam, A.H.M.S., et al. (2018). Farm diversification and food and nutrition security in Bangladesh: empirical evidence from nationally representative household panel data. *Food Security*, 10(3), 701-720. DOI:10.1007/s12571-018-0806-3

Mohammed, H., & Aboud, F. (2019). Adaptation of a mental development assessment tool for the evaluation of the long-term effect of a successful nutrition intervention in Ghana. *Maternal & Child Nutrition*, e12829. DOI:10.1111/mcn.12829.

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