Feed the Future Innovation Lab

For Collaborative Research on Global Nutrition

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Agriculture, Food Systems, and Nutrition: Connecting the Evidence To Action

Nutrition Innovation Lab: 3rd Annual Scientific Symposium

November 18-20, 2014

SYMPOSIUM SUMMARY

The Nutrition Innovation Lab's partner, Johns Hopkins University, in collaboration with the Institute of Medicine and the Nepal Agriculture Research Council, hosted its 3rd annual Scientific Symposium in Kathmandu, Nepal on November 18-20, 2014. The question driving this symposium was simple: how can agriculture improve household food security and nutrition outcomes? Yet the work of understanding the agriculture to nutrition pathway is complex. Building sustainable systems that promote food security, nutrition, and health in Nepal requires the utilization of high-quality, empirical evidence. The implications of understanding agriculture to nutrition pathways in Nepal are far-reaching; as stated by USAID Mission Director to Nepal, Dr. Beth Dunford, "the world is looking at Nepal for evidence of what works."

Please visit the following links for more information:

3rd Annual Scientific Symposium: Presentations

3rd Annual Scientific Symposium: Audio Files

JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

Nepali Technical Assistance Group NTAG

KATHMANDU NEPAL

NARC Nepal Agricultural Research Council

OPENING SESSION

The symposium's theme of "Agriculture, Food Systems, and Nutrition: Connecting the Evidence to Action" reflects the need to not only highlight the empirical evidence generated by Nepali and other researchers, but to make this evidence useful to policymakers at a time when so many different sectors are collaborating to improve the nutrition and health of women and children in Nepal. The symposium, which featured 24 oral and 21 poster presentations, was attended by over 300 representatives of research, academic, government, programmatic, and donor institutions. This diversity speaks to the importance of hosting symposia to facilitate the rapid sharing of information between researchers and policymakers.

Dr. Govinda Raj Pokharel

The symposium began with a welcome by **Swetha Manohar** from the Nutrition Innovation Lab and **Dr. Rajendra Wagle** from the Institute of Medicine. **Dr. Beth Dunford**, USAID Mission Director to Nepal, provided an opening address in which she emphasized the need to not only build a body of empirical evidence to inform policies and programs, but to also share those findings rapidly and widely with policymakers.

Dr. Alan Dangour, Reader from the London School of Hygiene & Tropical Medicine, provided the keynote address on moving evidence to action in agriculture and health. Dangour noted the surprising paucity of evaluations of the effect of agricultural policies on nutrition outcomes. He framed this as a need to embed evaluation within agricultural policy work and an opportunity to do more evaluations of ongoing policies.

The Honorable Professor and Vice-Chairman of the National Planning Commission and Chief Guest, **Dr. Govinda Raj Pokharel**, set the tone for the symposium by speaking about the need to take a multisectoral approach to the common problem of malnutrition. Pokharel noted the co-dependence of Nepal's rural and urban areas on each other, as well as the need to strengthen the resilience of subsistence farmers. Against the backdrop of Nepal's challenging task of graduating from a 'least developed' to a 'developing' country, Pokharel painted a vision of graduating from farmers to new farmers, which he envisioned as connected, empowered farmers traveling on motorbike from the village to the market to sell milk and vegetables. Pokharel encouraged resources shared during the symposium to be utilized by Nepal's ministries and planning commission in developing suitable policies for the wellbeing of Nepali people.

Q & A Panel for the Session on 'Program Implementation Research: What's Working, What's Not? '

PROGRAM IMPLEMENTATION RESEARCH: WHAT'S WORKING, WHAT'S NOT?

1. Integrating Nutrition in Local Response Structures: An Example from Suaahara — *Bishow Raman Neupane*
2. Maternal Access to Information: Can *Bhanchhin Aama* Influence Child Diets? — *Akriti Singh*
3. Bridging the Gap: Food Security Response Analysis and Planning Based on the Nepal Food Security Monitoring System (NeKSAP) — *Chandra Thapa*

Bishow Raman Neupane reported on efforts to integrate nutrition into local response structures. Through community asset mapping, training of social mobilizers and ward citizen forum members, and the establishment of Nutrition and Food Security Steering Committees through the Suahaara multi-sectoral nutrition program, Neupane stated that 13 districts had allocated budget money towards nutrition activities among disadvantaged groups. Neupane emphasized that further research is needed to assess the effectiveness of governance interventions on nutritional status.

Akriti Singh reported on *Bhanchhin Aama*, a component of the Suaahara program that uses a radio program promoting the role of *aamas* in providing knowledge and changing social norms relevant to optimal health and nutrition behaviors. The program features a serial drama and a call-in session in which callers can receive information about health, nutrition, WASH topics, and family dynamics. Study results showed that listening to *Bhancchin Aama* was positively associated with complementary feeding practices and may be an effective strategy for behavior change.

Chandra Thapa discussed NeKSAP, Nepal's nationwide food security monitoring system. Thapa reported on a food security response analysis prototype created to address a lack of procedures to systematically link NeKSAP analyses to the Government of Nepal's annual district planning process. The prototype was field tested and was found to be helpful for better utilizing NeKSAP-generated data in order to develop district food security response plans and to inform the government's annual planning process. Efforts are underway for the prototype to be scaled up and harmonized with the Multi-Sectoral Nutrition Plan (MSNP) at the district level.

EVIDENCE FROM THE POLICY AND SCIENCE OF HEALTH, AGRICULTURE AND NUTRITION

1. Measuring Nutrition Governance in Nepal: Metrics of the Management of Multisectoral Plans *Patrick Webb*
2. Current Status and Changes: Results from the PoSHAN Community Studies 2nd Annual Panel Survey *Rolf Klemm*
3. Aflatoxin Exposure during the First 1000 Days of Life in Rural South Asia Assessed by Aflatoxin-Lysine Albumin Biomarkers *Keith West*
4. Barriers to Collaborative Agriculture and Nutrition Research *Claire Fitch*
5. Challenges to Turning Nutrition and Agricultural Research Findings into Action *Erin Biehl*

In the second session, three investigators from the Policy and Science of Health, Agriculture and Nutrition (PoSHAN) studies shared updates from the study's second year. **Dr. Patrick Webb** congratulated Nepal for having witnessed the fastest reduction of child stunting in the world in the past ten years, but he noted that our conventional predictors such as birth size and asset accumulation only explain approximately one-third of this reduction. Webb pointed to nutrition governance as an area that may explain some of this reduction but is vastly under-researched. Webb reported that the PoSHAN Policy Study is using annual panel surveys with policy and program actors in Nepal in order to assess the capacity and commitment to achieve nutritional outcomes at all levels of governance, with the goal of creating a Nutrition Governance Index.

Dr. Rolf Klemm shared updates from the PoSHAN Community Studies, which conducts multi-year panel surveys with newly married women with children under age five across Nepal's three agro-ecological zones. PoSHAN Community Studies has released its baseline report and has started to compile preliminary results from the second annual panel survey. Klemm shared changes in various indicators from the baseline report, as well as observations about variation between zones. Interestingly, the data showed that households in the terai tended to have more wasting and anemia in mothers and children, despite the terai's lower food prices, lower agricultural input prices, and higher dietary diversity.

Dr. Keith West reported on the use of biomarkers to measure aflatoxin. Aflatoxin is part of a family of toxins produced by the *Aspergillus* fungus that is commonly found in cereal crops in hot, humid climates and unprotected food systems. Dr. West emphasized that as an environmental anti-nutrient and an indicator of the quality of food systems, aflatoxin is an important component of the agriculture to nutrition pathway. Data on aflatoxin in Nepal is scarce, and PoSHAN presents an opportunity to fill that gap. West reported on AFB1, a carcinogenic product of aflatoxin metabolism that can be used to measure both exposure to and metabolism of aflatoxin.

Claire Fitch and **Erin Biehl** presented on barriers and facilitators to working collaboratively across and within sectors towards nutrition goals. The presenters pointed out that although research in agriculture and human nutrition have historically been conducted in isolation from each other, there is much to be gained from collaboration between these two sectors. Fitch and Biehl used key informant interviews to examine barriers that organizations face when engaging in collaborative research and challenges that NGOs face in using evidence to inform their nutrition-sensitive and nutrition-specific interventions.

Q & A Panel for the Session on 'Sustainable Agriculture Innovations'

SUSTAINABLE AGRICULTURE INNOVATIONS

1. Livestock Adaptation & Climate Change Innovation Lab: Nutrition Impact to Livestock and Humans – A Climate Resilient Approach in Gandaki River Basin, Nepal — *Mohan Sharma*
2. Sustainable Carp and Nutrient-Rich Small Fish Farming for Household Income Generation — *Sunila Rai*
3. Integrating B-Carotene Enriched Orange Sweet Potatoes in Aquaculture by Small Fish Farmers — *Binesh Man Sakha*
4. Post-Harvest Drying of Cardamom by an Electric Dryer: Perceptions about Added Value — *Amar Bahadur Thing*

Four presenters shared research on sustainable agriculture. **Dr. Mohan Sharma** from the Agriculture and Forestry University in Chitwan emphasized that livestock and agriculture are highly vulnerable to changes in climate, which can impact nutrition through reduced fodder yield, reduced nutrient content of staple crops, and disrupted topsoil. Sharma shared that smallholder farmers in the Gandaki river basin may be able to increase livestock production after being trained to perform climate-adaptive agricultural practices such as climate adaptive fodder, furrow and drip irrigation, and mixed farming of cereals and legumes.

Dr. Sunila Rai described efforts by the Agriculture and Forestry University in Chitwan to enhance both household income and nutrition by promoting polycultures of carp and small fish. Rai explained that carp are nutrient poor in comparison to other breeds of small fish, but production of both can be enhanced by training farmers to install bamboo substrates to add oxygen and remove excess nutrients from fish ponds.

Binesh Man Sakha similarly worked with small fish farmers. He described efforts by the Nepal Agriculture Research Council to integrate aquaculture with nutrition-sensitive agriculture by training farmers to cultivate orange sweet potatoes (which are enriched with Beta-Carotene) in pond dikes. Sakha analyzed the yields and acceptability of four orange sweet potato genotypes and one standard control, in order to identify genotypes for further promotion.

Amar Bahadur Thing described efforts by the New Energy Group to promote the use of electric dryers for cardamom. The use of power generated by micro hydro plants (MHPs) for electric dryers supports the long-term sustainability of the MHPs, which are largely underutilized despite their promotion by the government of Nepal. Additionally, drying is the key to cardamom quality, and the use of electric dryers instead of conventional drying methods has the potential to increase the market quality of cardamom and to subsequently increase household income.

MARKET DEVELOPMENT & ACCESS

1. Scaling Agricultural Technologies through Market Development: Examples from the CSISA *Andrew McDonald*
2. Food Prices, their Determinants and Connections to Child Nutrition in Nepal *Gerald Shiveley*

Shifting the discussion from agricultural production to distribution, two presenters focused on market access in rural areas of Nepal. **Dr. Andrew McDonald**, an agronomist, used examples from the Cereal Systems Initiative for South Asia (CSISA) to demonstrate the challenges and opportunities that occur when using market development to scale up agricultural technologies. McDonald emphasized that scaling up innovations is more than just an engineering problem: agricultural innovations need to be feasible, desirable for users, and viable for the market. McDonald noted that in order to bridge the gap between the development of innovations in the public sector and their uptake in the private sector, we need to analyze systemic constraints such as low market volume or lack of support services. McDonald shared some of the intelligence-led approaches that can be used to perform these assessments, such as market segmentation to understand the needs of different farm types and remote sensing to understand analyze suitability for irrigation. In order to build a "business case" for innovations, McDonald suggested aligning incentives for all actors in the value chain.

Dr. Gerald Shively, an agricultural economist, presented data on rice prices across Nepal in relation to stunting data. Shively cautioned that while food prices account for some of the variation in nutrition outcomes, the data use averages and therefore the trends predicted may not always match the outcomes seen in specific districts. Shively shared that nutrition outcomes such as stunting are less sensitive to food prices in areas where markets are not as connected, and that the effect of food prices on nutrition outcomes is mediated by whether people are predominantly buyers or sellers or food (that is, high food prices may actually be advantageous when people are more likely to be sellers of food). Shively emphasized that understanding points of entry to improve market infrastructure and food prices can serve as policy instruments to increase resilience in the face of environmental changes such as those that may accompany climate change.

Q & A panel for the Session on 'Generating Evidence for Multi-Sectoral Approaches to Improve Nutrition'

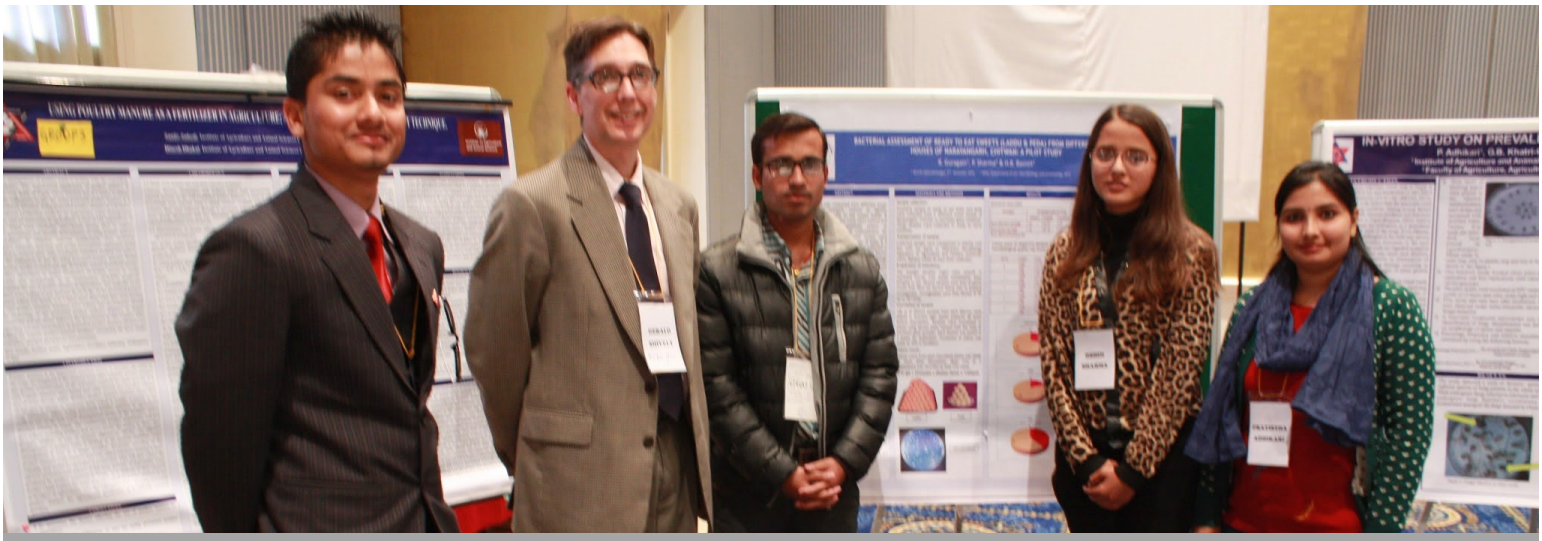
GENERATING EVIDENCE FOR MULTI-SECTORAL APPROACHES TO IMPROVE NUTRITION

1. Women's Empowerment in Agriculture and Child Length for Age in Rural Nepal: A Cross-Sectional Analysis	*Kenda Cunningham*
2. Validation of a Photographic Food Atlas in Dhanusa and Mahottari Districts of Nepal	*Helen Fry*
3. Impact Evaluation of Agriculture and Food Security Project (AFSP)	*Sumit Karn*
4. Design of an Impact Evaluation of 'Sunaula Hazar Din' Community Action for Nutrition Project	*Manav Bhattarai*
5. Household and Child Dietary Quality across Seasons in Rural Nepal: Effectiveness of a Community Development Intervention	*Laurie Miller*
6. Monitoring the Effect on Household Food Security of Food and Cash Transfers to Pregnant Women in the Low Birth Weight South Asia Trial	*Naomi Saville*

Day 2 of the symposium ended with a collection of presentations demonstrating the breadth of methodologies needed to build evidence for improving nutrition across sectors. Two presenters shared their research to improve the metrics used in the agriculture to nutrition pathway. **Dr. Kenda Cunningham** presented on women's empowerment as a tool for understanding how care resources influence childhood nutritional status. Using index measures of women's empowerment in agriculture (the WEAI), Cunningham found that women's empowerment was an important influence for nutritional status, but cautioned that this relationship varies by dimension of empowerment. **Helen Fry** shared her work on improving metrics of dietary intake, as the conventional methods of measuring dietary intake can be highly inaccurate. Fry found that a photographic food atlas aided the accurate recall of dietary intake, and she identified foods that were routinely over- or under-estimated in a Nepali context.

Two presentations described ongoing World Bank initiatives, which both use early-starting and late-starting VDCs to measure the effects of the interventions. **Sumit Karn** reported on the impact evaluation framework and baseline results for the Agriculture and Food Security Project, which aims to improve the livelihoods of low-income farmers through increased agricultural outputs and improved nutritional practices. Karn noted the importance of complementing supply-side interventions with demand-side interventions, and **Manav Bhattarai** presented on one such demand-side intervention. Bhattarai reported on Sunaula Hazar Din, a demand-driven community action nutrition project that trains Rapid Results coaches to help 282 VDCs perform their choice of interventions to reduce stunting within the first 1000 days of life.

Drs. Laurie Miller and Naomi Saville presented evaluations of different approaches to improving food security and dietary intake. **Dr. Laurie Miller** discussed the influence of Heifer International's livestock-based approaches on the diets of children. Miller noted that even though livestock-based community development initiatives may not have an explicit focus on nutrition, they still have the potential to affect nutrition outcomes. **Dr. Naomi Saville** reported on preliminary results from a study on the effect of food and cash transfers to pregnant women on household food security in the Low Birth Weight South Asia Trial. The trial used participatory learning and action groups with pregnant women to distribute education, food transfers, and cash transfers. It also used mobile phones to keep track of pregnant women, births, and deaths, and to schedule data collection.



Poster session presentations during the 'Student Session'

RIGOR IN RESEARCH AND STUDENT SESSION

The third day of the symposium featured a new addition – an invitee-only session for academics and students on evidence and rigor in research design. Drs. Keith West, Patrick Webb, and Alan Dangour presented on the concept of rigor, systematic reviews, and types of evidence that can be applied to research and programming. Additionally, for the first time, a student session allowed 55 students (2-3 each nominated from 5 Nepali universities) to receive feedback on their research through poster sessions with their peers and with interdisciplinary faculty from Nepali and U.S. universities. Student posters covered topics including agricultural practices, underutilized crops, aquaculture, livestock, household food security, child feeding practices, economic assessments, and community development interventions. Winners for the student poster session were Sanjiv Subedi (IAAS), Prasistha Adhikari (IAAS) and Suneel Prayani (IOM).

THE WAY FORWARD

In their closing address, 'Highlights and the Way Forward,' **Atmaram Pandey** and **Dr. Ramesh Adhikari** saluted **promising young students of Nepal** who are engaged in research in this critical area of agriculture and nutrition.

Pandey reiterated that improvements in nutritional status can only be achieved if we **coordinate interventions** in the fields of agriculture, food security, WASH, education, and local development. He noted that the Multisectoral Nutrition Plan provides a framework for this type of engagement.

Adhikari highlighted that **investment in capacity building has been decades underway.** He noted that educational and community structures have increased multifold in terms of their capacity to identify problems, conduct research, implement interventions, and deliver education across Nepal.

Adhikari also shared the **importance of contextualizing the data generated to convince policymakers to take action.** Adhikari urged us to work hard to 'make our materials more friendly for [policymakers] to understand, to show them where this information can fit.'

The symposium highlighted that **new frontiers in research on the agriculture to nutrition pathway** include evaluating ongoing policies, identifying points of entry for policies to impact nutrition outcomes, and strengthening metrics at all steps along the pathway.

POSTER SESSION

Winners of the 'Poster Session' held on the second day of the symposium were Naresh Shahi and Indu Adhikary, voted for by the symposium's attendees

Presenter's Name	Poster Title
Abhishek Khadha	Change in anti-nutritional and reducing sugar value during germination in some varieties of finger millet in Nepal
Adam Richter	Non-timber forest products and childhood undernutrition: A review of the literature
Amrit Prasad Poudel	Evaluation of quality protein maize for food and nutritional security in the western hills of Nepal
Madhusudhan Ghimire	Roles of cooperatives in household food security: Insights from Rupandehi, Lalitpur, Kabhrepalanchowk and Sindhupalchowk
Claire Fitch	Is diversity in agriculture production linked to dietary diversity among Nepalese women? Findings from the PoSHAN Community Studies
Erin Biehl	Does amount and kind of food bought by a household vary by indices of wealth in Nepal?
Indu Adhikary	Commercial snack foods in the diets of infant and young children: Assessment and research in child feeding (ARCH)
Indu Sharma	Tracking commitment to a Multi Sector Nutrition Plan (MSNP) in Nepal
Jamie Dorsey	Linking antenatal and postnatal care, maternal health knowledge, and behavior among women in the PoSHAN Community Studies in Nepal
Krishna Kaphle	The holy cow: Potentials of indigenous cattle in self-subsistence and their conservation efforts in Nepal
Manoj Kumar Shah	Study on the response of breed, feeds, and probiotics on the performance of meat type rabbit
Naresh Shahi	Household washing solutions to improve safety of fresh produce
Neena Joshi	Growth and health of rural children in 3 districts of Nepal: Effect of a Community Development Intervention over 48 months
Ranju Kumari Mehta	Exclusive breastfeeding practices among 6 to 11 month old children in Nepal
Resham B. Amgai	Variation on protein content on different accessions of Nepalese underutilized crops
Resham B. Khatri	Prevalence and factors associated with under-nutrition among children of freed-bonded (Kamiya) laborers in Nepal
Rina Tiwari	Determinants of stunting and severe stunting among under-fives: Evidence from the 2011 demographic and health survey
Sanjiv Subedi	An economic assessment on use of poultry manure as a fertilizer in agriculture
Surendra Lal Shrestha	Assessment of tomato cultivars for salad purpose to supplement nutrition in mid-hills of Nepal
Tara Nath Gaire	Livestock health situations in Gandaki river basin and Terai arch landscape in context of climate change in Nepal
Varsha Upraity	Fish for food security and improved nutrition